ANIMATE FIGHT MOVES

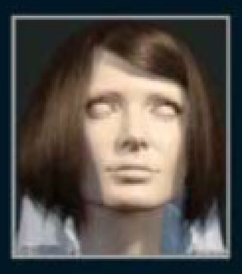
**5GB OF FREE ASSETS EQUIVALENT TO 8 DISCS**

# 3D Artist

www.3DArtistonline.com

76

Practical inspiration for the 3D cor



## CREATE ZBRUSH HAIR IN 17 STEPS

Explore an artistic real-time workflow

# 3DS MAX MASTERCLASS

- Perfect characters
- Refine your technique
- Achieve incredible results

NUKE STUDIO PAGE 80

## Maya rigging

Set up your characters easily and efficiently using Smart Skinner

## ACHIEVE BETTER LIGHTING

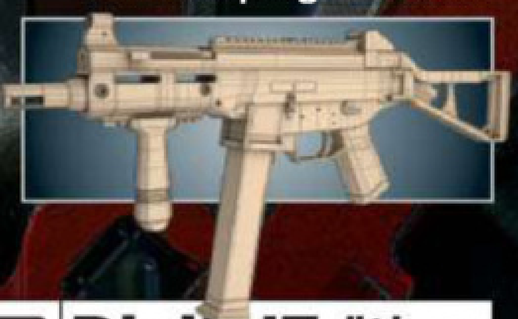
The experts come together to bring you 24 ways to improve

**PLUS**

- V-Ray 3.0 for Maya
- Substance Painter 1.0
- Win a copy of iClone 6
- Simulate a tornado

## Model an FPS weapon

Generate pro game assets



## 8 DISCS' WORTH OF CONTENT

- MODELS WORTH $150
- 20% OFF UNWRELLA FOR 3DS MAX AND MAYA
- 25 3DTOTAL TEXTURES
- 3 PANORAMIC HDRIS

## Sculpt a sci-fi soldier

Learn all you need to know about the ZBrush to Photoshop pipeline with our step-by-step guide

ip IMAGINE PUBLISHING

DigitalEdition

GreatDigitalMags.com

ISSUE 076

# THE ULTIMATE WORKSTATION EXPERIENCE FOR REAL-TIME 4K

## TAKE YOUR PROJECTS FURTHER, FASTER BY ADDING BEST-IN-CLASS GPU COMPUTE TO YOUR WORKSTATION[1]

Designed for the most demanding workflows the AMD FirePro™ W8100 graphics card packs up to 4.2 TFLOPS of compute power to accelerate your projects beyond just graphics. Powered by OpenCL™, Video and Design professionals can work with multiple graphics- and compute-intense applications across up to four 4K displays[2].

2560 Stream processors (44 CUs)
8GB GDDR5 memory (320 GB/s)
4.2 TFLOPS peak single precision
2.1 TFLOPS peak double precision
Designed to support OpenCL 2.0[3]
4 DisplayPort 1.2 outputs for 4K support

*For more information visit*

***www.fireprographics.com/ultra***

**Now available at selected partners:**

**Scan Computers**
www.scan.co.uk
0871 472 4787

**Workstation Specialists**
www.workstationspecialist.com
0800 180 4801

**Amari**
www.armari.com
0192 322 5550

© Copyright 2014 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, FirePro, and combinations thereof are trademarks of Advanced Micro Devices, Inc. OpenCL and the OpenCL logo are trademarks of Apple Inc. used by permission by Khronos. Other names are for informational purposes only and may be trademarks of their respective owners. 1 AMD FirePro™ W8100 delivers 4.2 TFLOPS peak single-precision floating point performance, while the closest competing solution from Nvidia (as of June 2014) is the Quadro K5000 which offers only 2.15 TFLOPS. Visit http://www.nvidia.com/content/PDF/line_card/6660-nv-prographicssolutions-linecard-july13-final-lr.pdf for Nvidia product specs. FP-93 2 AMD FirePro™ W8100 features 8GB memory. Nvidia's competing card in the market as of June 2014 is the Quadro K5000 with 4GB memory. Visit http://www.nvidia.com/content/PDF/line_ card/6660-nv-prographicssolutions-linecard-july13-final-lr.pdf for Nvidia product specs. FP-94 3 Support for OpenCL 1.2 enabled today; conformance expected. AMD plans to release OpenCL 2.0 drivers for AMD FirePro™ professional graphics cards in Q4 2014; conformance testing will be completed at that time. Images courtesy of © Uli Staiger - www.dielichtgestalten.de

## Dmitriy Rabochiy

**Personal portfolio site**
art-grizzly.tumblr.com

**Country** Ukraine

**Software** 3ds Max, ZBrush, V-Ray, KeyShot

*Head over to p26 to see a showcase of Dmitriy's incredible 3ds Max character work, and also discover the secrets to his advanced workflow. He's in good company, too, as we have four other 3ds Max experts showing off their own considerable talents and sharing their vast knowledge.*

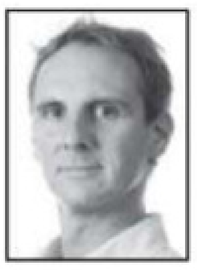
“The most useful tool in 3ds Max is ‘Help’ – people do not think it but it contains so much information!”

**Dmitriy Rabochiy** discusses advanced 3ds Max characters on **Page 26**

24 tricks for better lighting Page 36

# Welcome

## to the magazine and 100 pages of amazing 3D



**Welcome to 3D Artist magazine!** Character design is the beating heart of many a 3D artist's workflow. In this issue, we speak to some amazing, imaginative character artists and dive headfirst into their 3ds Max creations starting on p26. Elsewhere in the magazine, learn how to craft real-time hair in ZBrush (p56), discover professional techniques to improve your lighting (p36) and find out what we thought of NUKE Studio (p80). Enjoy the issue!

*Dan Hutchinson* Editor in Chief

### Every issue you can count on...

1. **Exclusively commissioned art**
2. Behind-the-scenes guides to images and fantastic artwork
3. **Digital downloads full of handy assets**
4. Interviews with inspirational artists
5. **Tips for studying 3D or getting work in the industry**
6. The chance to see your art in the mag!

## This issue's team of expert artists...

### Tom Parker

Tom has provided us with his talents this month to walk you through creating real-time hair for videogames in ZBrush. Check out his step-by-step tutorial on p56.

### Nikita Kuzmichev

Take a look at p46 for Nikita's super in-depth ZBrush and Photoshop sci-fi tutorial, as he takes you from blocking out meshes to the final render in 16 steps.

### Vikrant Dalal

VFX expert Vikrant is here to teach you how to simulate an accurate tornado effect using 3ds Max and the FumeFX plugin. His tutorial begins over on p72.

### Orestis Bastounis

Our technology wizard Orestis has taken a magnifying glass to two different workstations this month. Head over to p84 to discover his expert verdicts.

### Paul Champion

Compositing pro Paul Champion has been on a review rampage this month, providing his expert opinions on both NUKE Studio and Substance Painter 1.0, starting on p80.

### Brent J Zorich

Brent is a clever chap, having written his own Smart Skinner for Maya. On p76 he reveals how using the Smart Skinner for auto-rigging can save you hours of time.

### Geoff Kirk-Smith

The Assembly's senior character animator has turned his attentions to V-Ray 3.0 for Maya this month, putting the lighting, shading and rendering tool through its paces.

### Digital-Tutors

The CG experts over at Digital-Tutors have worked their educational magic again. This month, learn how to model a weapon and animate fight moves in 3ds Max.

### Chris McMahon

Former **3D Artist** editor Chris speaks to Chris Doran, director at Geomerics, over on p92 about real-time lighting in videogames and the benefits of using Enlighten.

## Sign up, share your art and chat to other artists at www.3dartistonline.com


3DArtist

Imagine Publishing Ltd
Richmond House, 33 Richmond Hill
Bournemouth, Dorset BH2 6EZ
☏ +44 (0) 1202 586200
**Web:** www.imagine-publishing.co.uk
www.3dartistonline.com
www.greatdigitalmags.com

### Magazine team

**Editor in Chief Dan Hutchinson**
dan.hutchinson@imagine-publishing.co.uk
☏ 01202 586283
**Production Editor Steve Holmes**
**Senior Staff Writer Larissa Mori**
**Production Editor Carrie Mok**
**Senior Designer Chris Christoforidis**
**Photographer James Sheppard**
**Senior Art Editor Duncan Crook**
**Publishing Director Aaron Asadi**
**Head of Design Ross Andrews**

**3dartistmagazine** **@3DArtist**

**Contributors**
Orestis Bastounis, Paul Champion, Vikrant Dalal, Philippa Grafton, Phil King, Nikita Kuzmichev, Chris McMahon, Tom Parker, Geoff Kirk-Smith, Ella Carter Sutton, Tim Williamson, Brent J Zorich

**Advertising**
Digital or printed media packs are available on request.
**Head of Sales** Hang Deretz ☏ 01202 586442
hang.deretz@imagine-publishing.co.uk
**Advertising Manager** Alex Carnegie ☏ 01202 586430
alex.carnegie@imagine-publishing.co.uk
**Account Manager** Simon Hall ☏ 01202 586415
simon.hall@imagine-publishing.co.uk

**FileSlio.co.uk**
Assets and resource files for this magazine can be found on this website. Register now to unlock thousands of useful files.
Support: filesilohelp@imagine-publishing.co.uk

**International**
**3D Artist** is available for licensing. Contact the International department to discuss partnership opportunities.
**Head of International Licensing** Cathy Blackman
☏ +44 (0) 1202 586401
licensing@imagine-publishing.co.uk

**Subscriptions**
To order a subscription to **3D Artist**:
☏ UK 0844 249 0472
☏ Overseas +44 (0) 1795 592951
Email: 3dartist@servicehelpline.co.uk
6-issue subscription (UK) – £21.60
13-issue subscription (UK) – £62.40
13-issue subscription (Europe) – £70
13-issue subscription (ROW) – £80

**Circulation**
**Head of Circulation** Darren Pearce ☏ 01202 586200

**Production**
**Production Director** Jane Hawkins ☏ 01202 586200

**Founder**
**Group Managing Director** Damian Butt

**Printing & Distribution**
Printed by William Gibbons & Sons Ltd, 26 Planetary Road, Willenhall, West Midlands, WV13 3XT
Distributed in the UK, Eire & the Rest of the World by Marketforce, Blue Fin Building, 110 Southwark Street, London SE1 0SU
☏ 0203 148 3300, www.marketforce.co.uk
Distributed in Australia by Network Services (a division of Bauer Media Group), Level 21 Civic Tower, 66-68 Goulburn Street, Sydney, New South Wales 2000, Australia ☏ +61 2 8667 5288



**Disclaimer**
The publisher cannot accept responsibility for any unsolicited material lost or damaged in the post. All text and layout is the copyright of Imagine Publishing Ltd. Nothing in this magazine may be reproduced in whole or part without the written permission of the publisher. All copyrights are recognised and used specifically for the purpose of criticism and review. Although the magazine has endeavoured to ensure all information is correct at time of print, prices and availability may change. This magazine is fully independent and not affiliated in any way with the companies mentioned herein. If you submit material to Imagine Publishing via post, email, social network or any other means, you automatically grant Imagine Publishing an irrevocable, perpetual, royalty-free license to use the material across its entire portfolio, in print, online and digital, and to deliver the material to existing and future clients, including but not limited to international licensees for reproduction in international, licensed editions of Imagine products. Any material you submit is sent at your risk and, although every care is taken, neither Imagine Publishing nor its employees, agents or subcontractors shall be liable for the loss or damage.

© Imagine Publishing Ltd 2015


ISSN 1759-9636


recycle
When you have finished with this magazine please recycle it

SIDE EFFECTS SOFTWARE

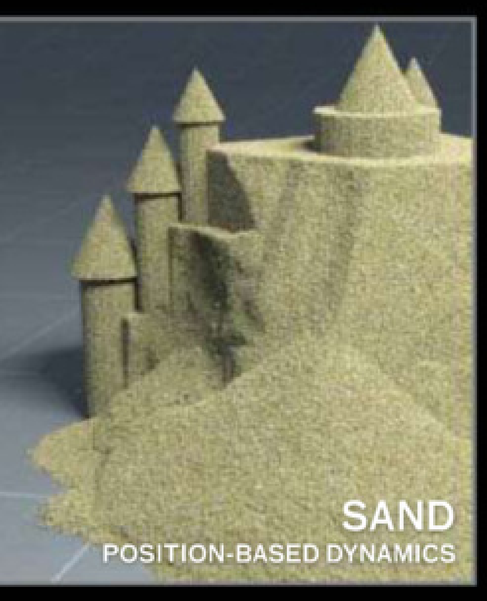
# Houdini
3D ANIMATION TOOLS

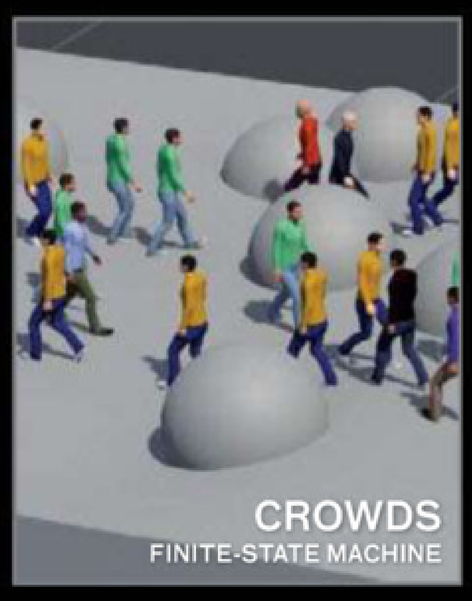
## Procedural Content Creation gets a Boost with Exciting New Houdini 14 Features

Digital artists, like yourself, are being asked to create more animation and VFX shots while achieving more realistic results with tighter deadlines and shrinking resources. To handle the workload and keep focused on the creative process, you will want to go procedural with Houdini 14.

With a new position-based dynamics solver for creating wet and dry sand, grooming tools for hair and fur, user interface enhancements and new crowd tools, Houdini 14 brings a better user experience, improved scalability and optimized performance to VFX artists, animators and game makers.

**www.sidefx.com/H14**






## Work with Houdini Digital Assets Inside Your Favorite 3D App

In Houdini, networks of nodes can be easily wrapped up into Houdini Digital Assets then shared with other artists. With the Houdini Engine, these assets can be loaded into other applications such as Autodesk® Maya,® Cinema 4D, Autodesk® 3DS Max,® Unity® and Unreal,® with the asset's procedural controls available to artists.

Professional Houdini studios use Houdini Digital Assets to ensure consistency across a project. The Houdini Engine puts these efficiencies into the hands of all artists which will save your studio time and money.

In addition, HOUDINI INDIE makes Houdini's animation and VFX tools, and the Houdini Engine plug-ins, available under a limited commercial license for only $199 USD.

Houdini ENGINE

**www.sidefx.com/engine**

Background Artwork by Rezart SHEHU

**2015** | All rights reserved. Houdini, Houdini Engine and the Houdini logo are Trademarks of Side Effects Software Inc. registered in the USA and other countries. Autodesk, Maya and 3DS Max are registered trademarks or trademarks of Autodesk, Inc., in the USA and other countries. Cinema 4D is a trademark of MAXON Computer GmbH. Unity is a registered trademark of Unity Technologies. Unreal and its logo are Epic Games' trademarks or registered trademarks in the US and elsewhere. Other product and company names mentioned may be trademarks of their respective companies.

# Contents

76

What's in the magazine and where

## News reviews & features


**8 The gallery**
A hand-picked selection of incredible artwork to inspire you

**18 Community news**
Keep up to date with the latest news and win a copy of iClone 6

**22 Readers' gallery**
The 3DArtistOnline.com's community art showcase

**26 Feature: Mastering Max**
3ds Max geniuses walk you through advanced character creation and show off their own awesome designs

**36 Feature: 24 tricks for better lighting**
Industry experts reveal the most effective ways to use lighting to bring your artwork to life

**78 Subscribe today!**
Save money and never miss an issue

**80 Review: NUKE Studio**
Paul Champion dives excitedly into The Foundry's latest compositing powerhouse

**82 Review: Substance Painter 1.0**
Allegorithmic's increasingly popular tool is put to the test

**84 Review: Dell T5810**
Our tech expert Orestis Bastounis takes a look at Dell's latest mid-range workstation

**85 Review: Workstation Specialists WS-X180**
Orestis puts Workstation Specialists' monster through its paces

**87 Review: V-Ray 3.0 for Maya**
Assembly's Geoff Kirk-Smith digs in to Chaos Group's render engine

26

## Mastering Max

"3ds Max is one of the easiest tools to learn, and one of the most finished"

**Dmitriy Rabochiy** declares his love for 3ds Max **Page 26**

Sculpt a sci-fi soldier

46

Real-time hair in ZBrush

FREE ASSETS + TUTORIAL FILES
FileSilo
filesilo.co.uk/3dartist-76

SAVE 40%
SUBSCRIBE TODAY

Turn to page 78 for details

72

Simulate a tornado

70

Model a weapon

36

“Try different kinds of lights. I usually change my lighting setup every time – I really like to experiment”

**Ivan Stalio** gives us his two cents on lighting **Page 36**

56

66

# The workshop

**Expert tuition to improve your skills**

**66 Questions & Answers**
To help hone your abilities

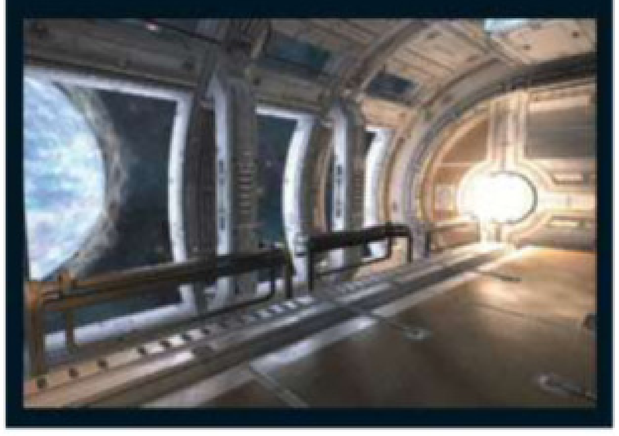
3ds Max: Animate fight moves
3ds Max: Model a weapon
FumeFX: Simulate a tornado
Smart Skinner: Maya rigging

## workspace

Industry news, career advice & more

**90 Industry news**
Get up to speed with industry events and key software updates

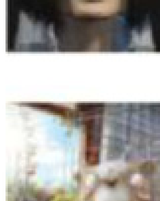
**92 Industry Insider: *Chris Doran***
The founder and director of Geomerics stops by to chat about Enlighten



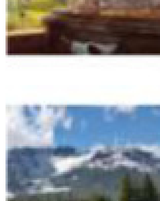
# The studio

## Professional 3D advice, techniques and tutorials

**34 Technique focus: *Pearlish Amorphoid***
Martin Bässler teaches you about creating structure



**44 Technique focus: *Wedding Night***
Flynn Lee discusses the importance of storytelling



**46 Step by step: Sculpt a sci-fi soldier**
Nikita Kuzmichev shows you how to improve your sculpts

**54 Technique focus: *Snail Love***
Aaron Wiesinger looks to nature for his inspiration

**56 Step by step: Create real-time hair in ZBrush**
Tom Parker reveals an artistic workflow for pro-level hair



**64 Technique focus: *In love with a ferris wheel***
Henrique Cassab Sasajima talks character creation



**94 Technique focus: *Mount St Helens***
Massimo Verona shows off his awesome environment design

Visit the **3D Artist** online shop at
imagineshop.co.uk
for back issues, books and merchandise

**DOWNLOAD** FROM THE
FileSilo

- Trials of BZP Pro Smart Skinners
- Exclusive 20% discount on Unwrella for Max and Maya
- 25 3DTotal textures
- Panoramic Maground HDRIs
- Arch-vis furniture assets

Turn to **page 96** for the complete list of this issue's **free downloads**
**filesilo.co.uk/3dartist-76**

# The Gallery

**Have an image you feel passionate about? Get your artwork featured in these pages**
Create your gallery today at **www.3dartistonline.com**

## Zhao Meng Long

After a background in sculpture and ceramic design, Zhao Meng Long began to create in 3D

**Personal portfolio** http://blog.sina.com.cn/u/5307873496

**Country** China

**Software** ZBrush, Mudbox, Maya, V-Ray

Work in progress...

"Earlier this year I inadvertently saw this image and had a good feeling about it. Then, I began production on re-creating it in 3D"

**Zhao Meng Long,** *John Fitzgerald Kennedy*, 2014

## Xin Gao

Xin Gao has years of experience working on modeling, texturing and rendering for iOS games

**Personal portfolio**
http://ufocome.cgsociety.org

**Country** China

**Software** ZBrush, Photoshop

Work in progress...

“My ideas often come from fantasy-themed media. For this piece, I created a race leader. He is very strong, looks evil, but is not bad. This work took about five days to complete”

**Xin Gao,** *The Mountains Leader,* 2014

> Images, be it an illustration of space or a visualisation simulating the complexities of nature, need a story behind them, however simple, in order to be emotionally appealing

**Yasamin Fathi,** *Dancing Ballerina*, 2014

## Yasamin Fathi

Yasamin is an architect who also spends her spare time creating atmospheric arch-vis imagery.

**Personal portfolio**
http://www.cgarchitect.com/members/view/yasaminfathi

**Country** Iran

**Software** Rhino3d, 3ds Max, V-Ray, Photoshop

Work in progress...

## Rodrigo Soria

Former illustrator Rodrigo is now a senior artist in Arizona producing all kinds of work in 3D

**Personal portfolio**
rodrigosoriacampos.blogspot.com.br

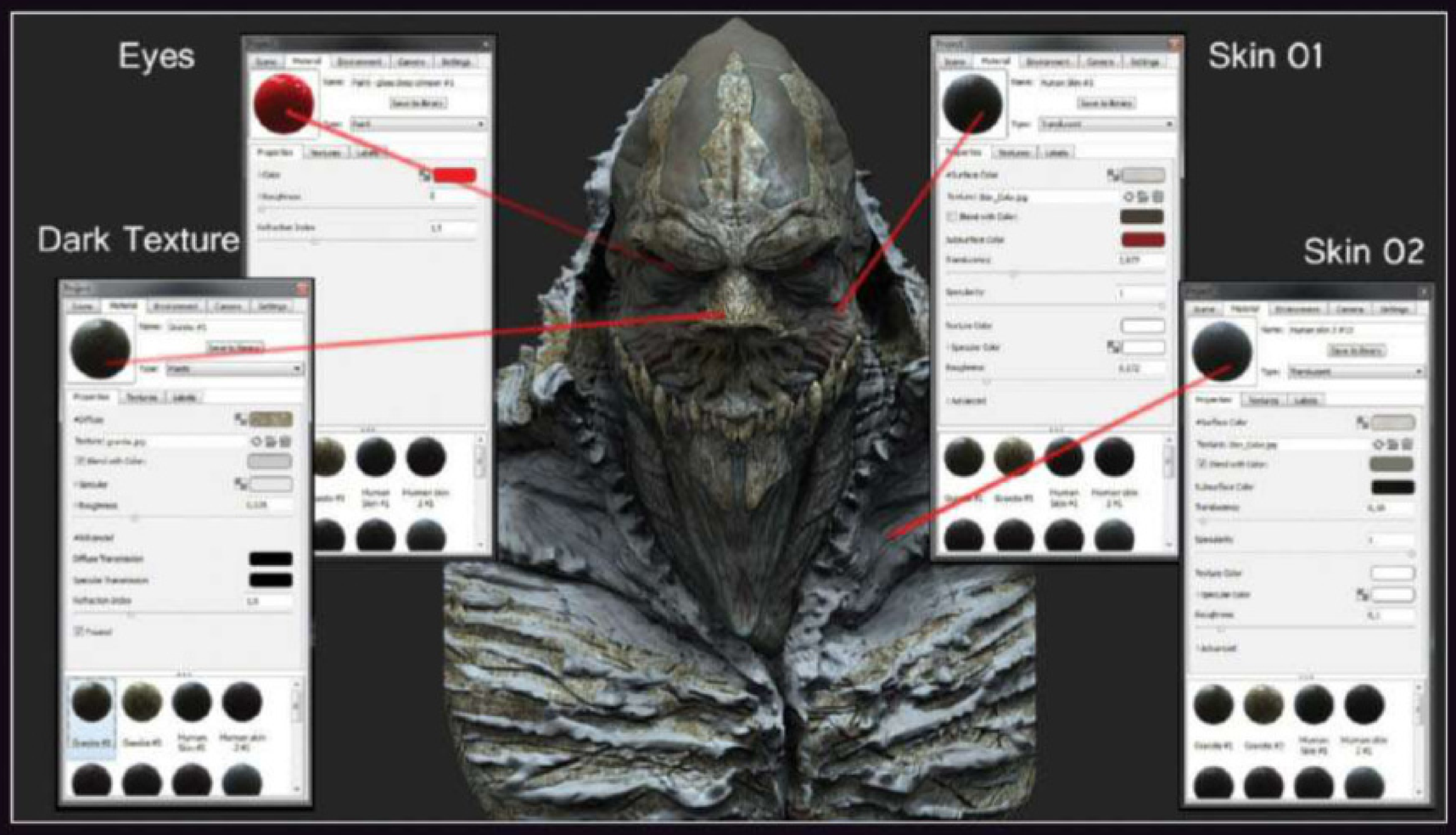
**Country** Brazil

**Software** ZBrush, Photoshop, KeyShot

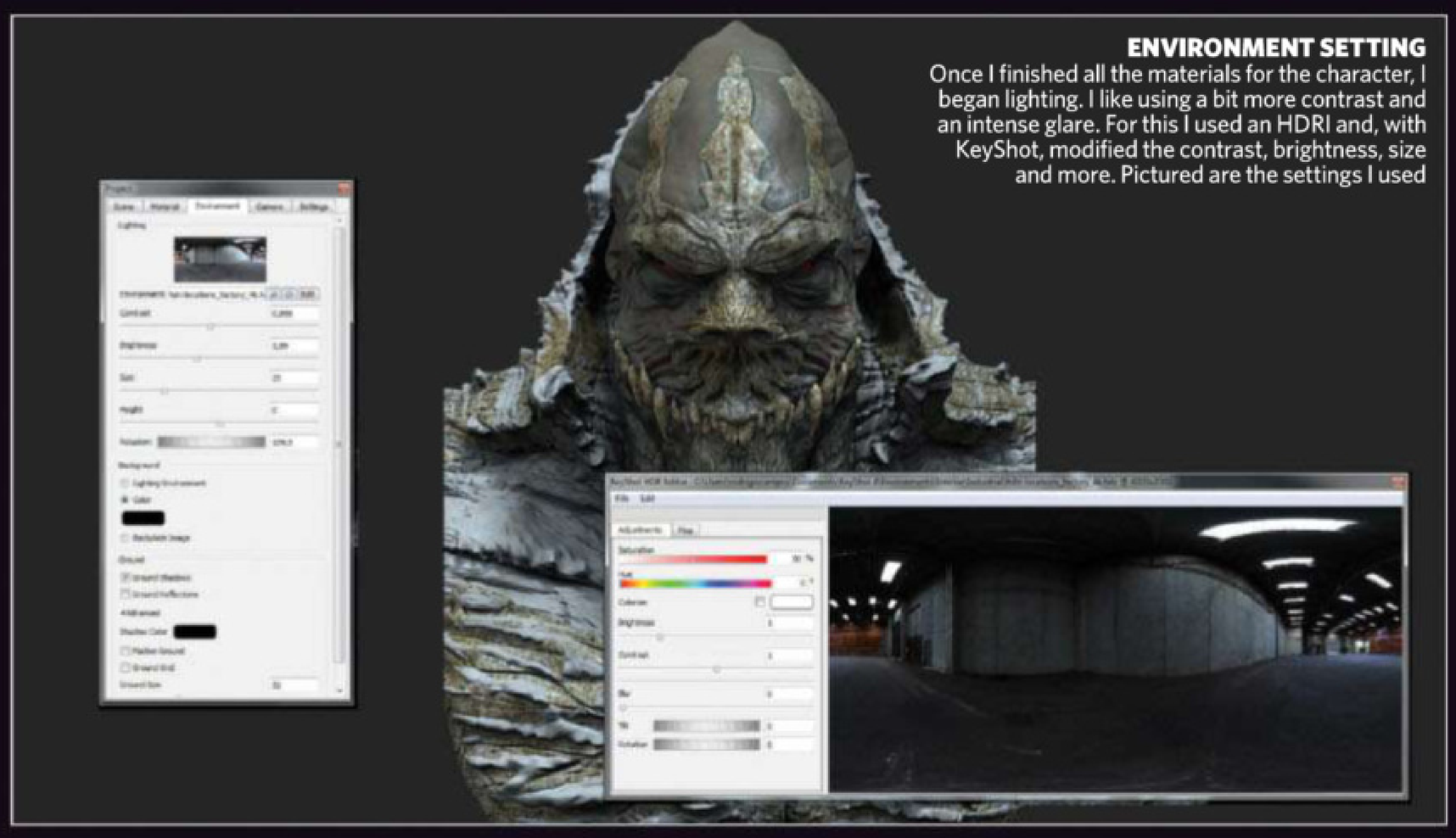
Work in progress...

“My initial idea was to create a concept for a Sentinel of Galaxies, a protector. I blocked its forms in ZBrush and as the work evolved, set more shapes, details and proportions”

**Rodrigo Soria,** *Sentinel,* 2014

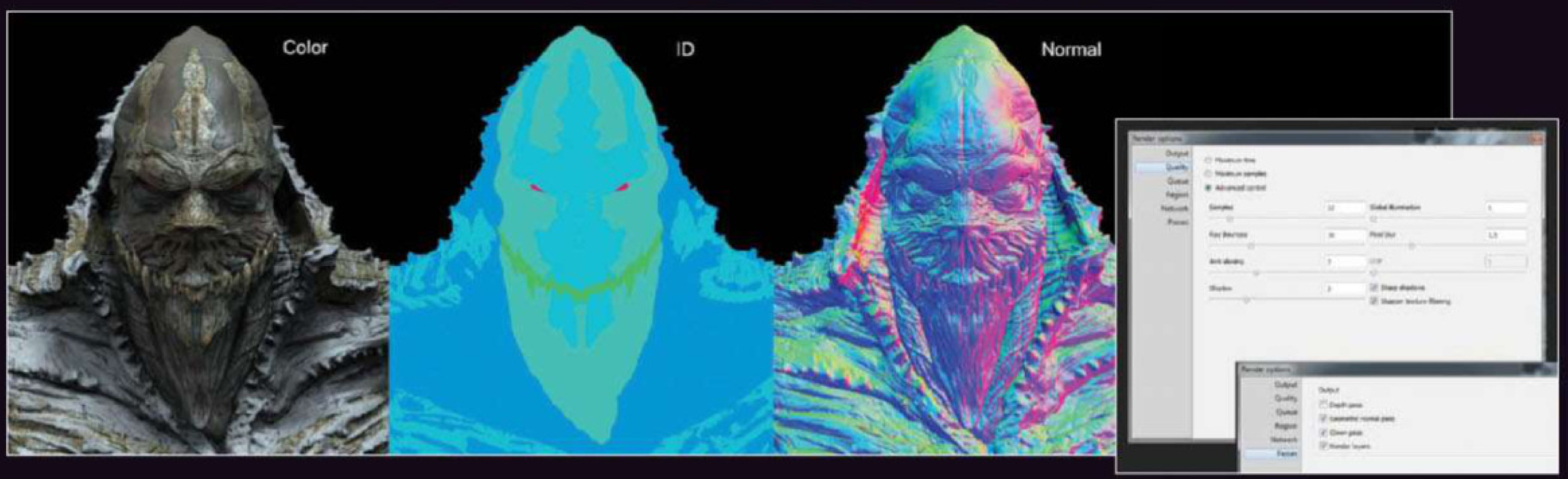



**MATERIALS**
All materials are native to the software; I only changed a few settings. Above are the corresponding settings for each SubTool of the character



**ENVIRONMENT SETTING**
Once I finished all the materials for the character, I began lighting. I like using a bit more contrast and an intense glare. For this I used an HDRI and, with KeyShot, modified the contrast, brightness, size and more. Pictured are the settings I used

**RENDER AND RENDER PASSES**
Setting the Render and Render passes I wanted for the output of the final work. I used the colour passes and ID to complete the image of the character, and the Normal pass for the visualisation of the character's shapes



**FINAL TOUCHES**
Using the ID pass in Photoshop, I separated all model geometry areas to have more control. First I made a base composition, to get the initial base colours, volumes, brightness and contrast. I then refined the dirt, sparkles in materials and model, controlled the contrast, and applied the enhancement to sharpen, then fixed the colours again before slightly adjusting shadows and adding any extra details.

## Anh Nguyen

**3DArtist online**

**Username:** anhnguyenarc

**Personal portfolio**
www.fresh-house.com

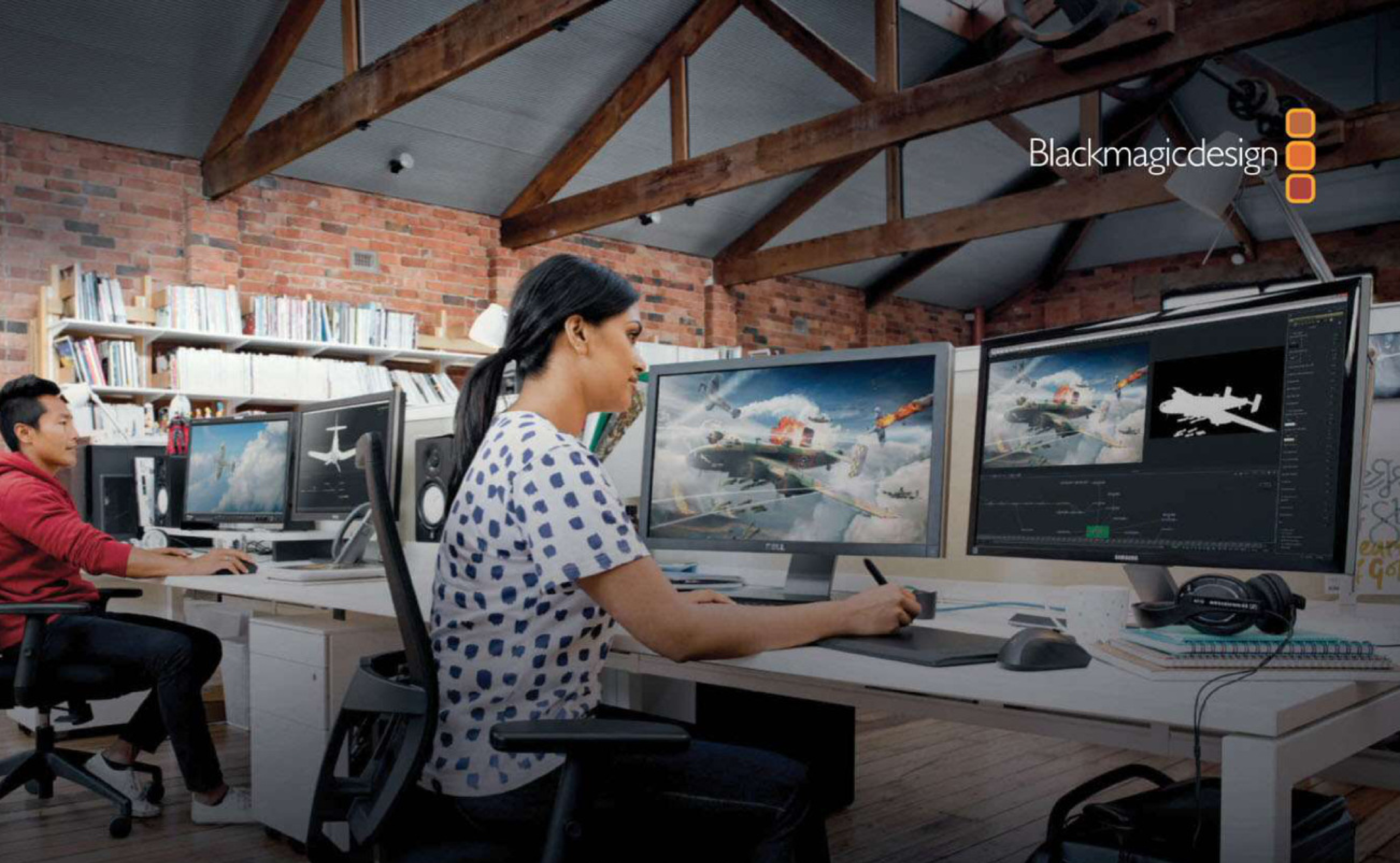
**Country** Vietnam

**Software** 3ds Max 2014, V-Ray 3.0, Photoshop

Work in progress...

“This is a 3D visualisation for a new restaurant opening up in Ho Chi Minh City. I worked with the client and DHC Company to come up with the concept and the industrial, yet high-class look”

**Anh Nguyen,** *Urban Kitchen+bar,* 2014



Blackmagicdesign

# FUSION 7

## Introducing the world's most advanced visual effects and motion graphics solution!

Fusion is the world's most advanced compositing software for visual effects artists, broadcast and motion graphic designers and 3D animators. With over 25 years of development, Fusion has been used on over 1000 major Hollywood blockbuster feature films! You get a massive range of features and effects included so you can create exciting broadcast graphics, television commercials, dramatic title sequences and even major feature film visual effects!

**Hollywood's Biggest Blockbusters**

Thousands of Hollywood's biggest blockbusters and hit television shows use Fusion to create their groundbreaking visual effects. Fusion has been used on feature films like Thor, The Amazing Spiderman 2, and The Hunger Games, as well as hit television shows like Orphan Black, Breaking Bad, Grimm, Adventure Time, Downton Abbey and the Emmy award winning Battlestar Galactica.

**Nodes, A Better Way to Work!**

Fusion uses nodes which are small icons that represent effects, filters and other processing which can be connected together to easily build up larger and more complex visual effects. Because nodes are easy to see and connect together, you can combine tools, images, and objects in any order to create unlimited visual effects. Nodes make it easy to adjust any single part of your project simply by clicking on the node and making an adjustment. That's much faster than a timeline based tool such as an NLE.

**Simply More Features**

Whether you need to pull a key, track objects, retouch images, animate titles, or create amazing particle effects, Fusion has a massive toolset that lets you tackle the most demanding visual effects and motion graphics jobs. You get the world's best 3D workspace along with tools for compositing, keying, painting, animation, stereoscopic 3D and more, all in a single application!

**GPU Accelerated Creative Workflow**

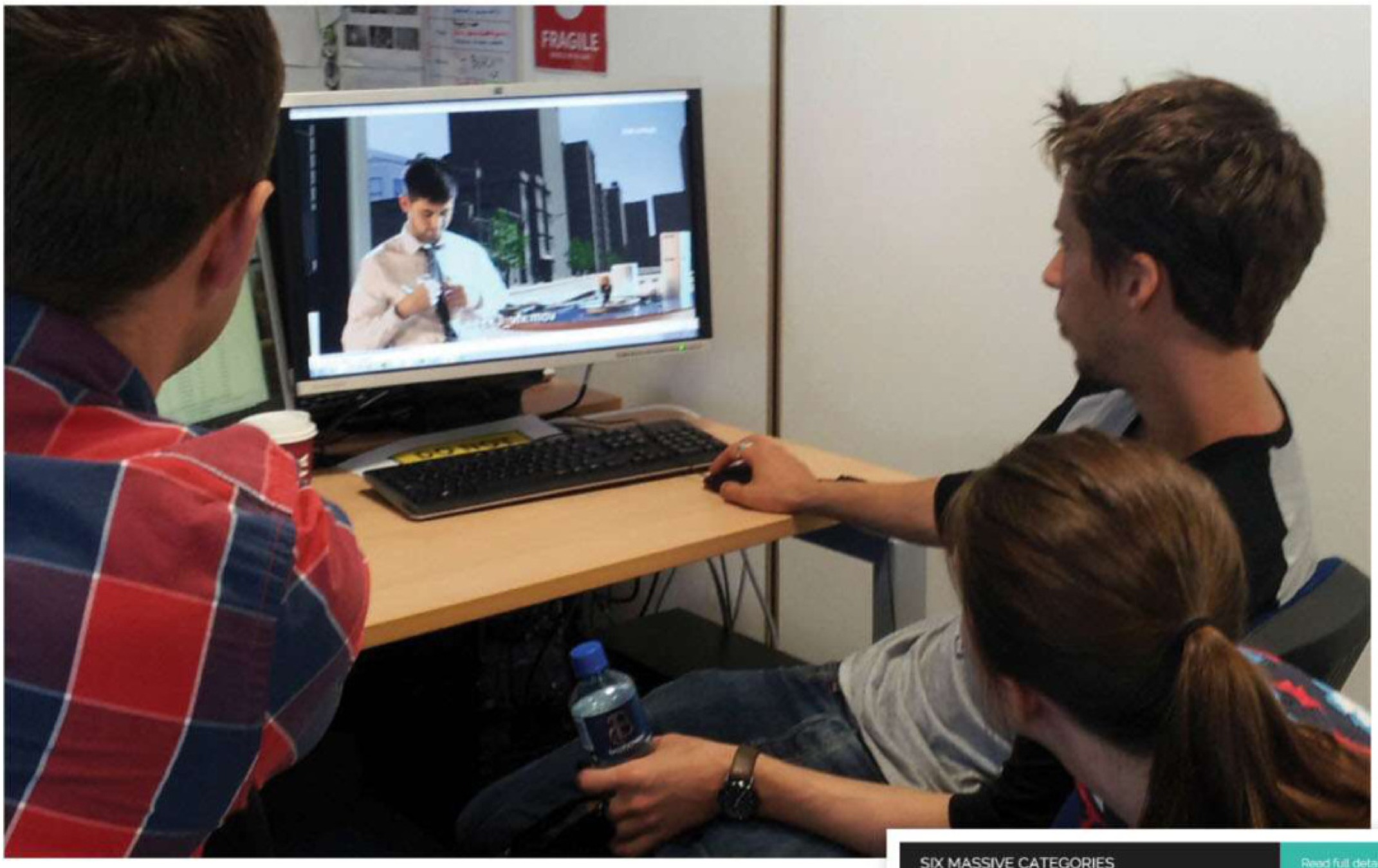
Fusion is an extremely fast visual effects software tool that's responsive enough to be used in high pressure, client driven sessions. With its GPU acceleration, you get instant feedback while you work so you can see exactly what you're doing. Whether you're working alone or with a client, Fusion gives you the real time control you need so you can spend more time being creative and less time waiting.

FUSION 7 ..... **Free**

FUSION 7 STUDIO ..... **£635***

Learn more today **www.blackmagicdesign.com/uk**

*SRP is Exclusive of VAT




# The year in CG

## Make sure you add these dates to your diary and attend the best international 3D events of 2015

### THE VFX FESTIVAL

**27 January – 29 January**

The VFX Festival, organised by leading visual effects academy, Escape Studios, has become one of the most highly anticipated events on the CG calendar since starting in 2012. Plus, at an easy walking distance for anyone working in the VFX hub of London's Soho district, it's also very easily accessible for attendees and industry speakers alike.

This year's festival takes place over three days, with each dedicated to a particular audience, from VFX newcomers to pros. Included in the schedule for 2015 will be an industry panel debate featuring key players across the industry, careers panels, and plenty of exclusive showcases into 2014's most popular blockbusters, animations, and games from studios such as Cinesite, Blue-Zoo, Framestore, and Pixomondo.

### FMX

**5 May – 8 May**

The 20th anniversary edition of Germany's conference on animation, games and transmedia will officially be taking place in Stuttgart this year!

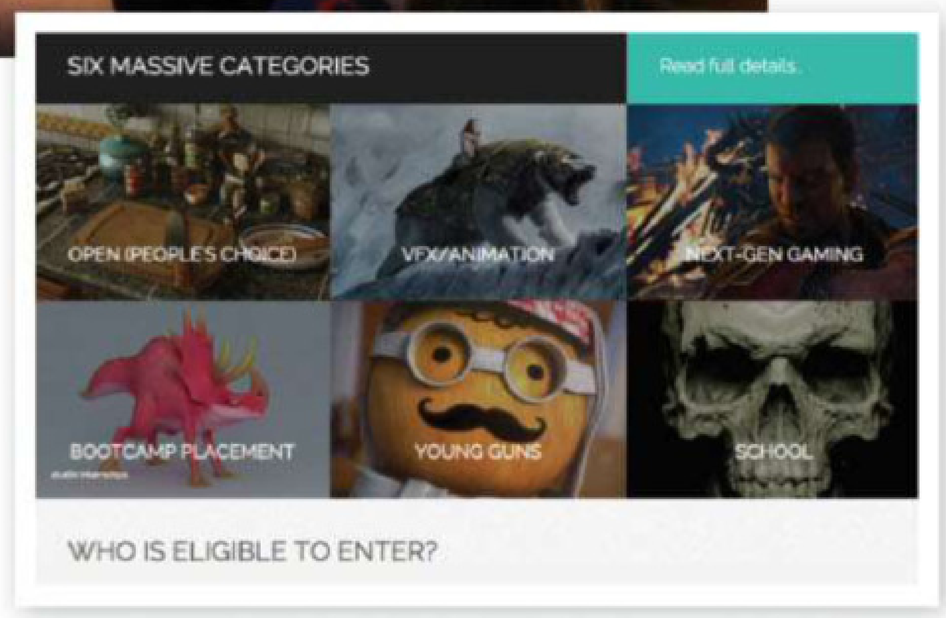
Organised by the Filmakademie Baden-Wüerttemberg – students of which have won multiple Oscars and Oscar nominations – this year's FMX conference will feature topics from virtual humans to funding and financing, as well as expert presentations and top-notch companies scouting for talent.

### CG STUDENT AWARDS

**3 March - 19 June**

Though not strictly a physical event, this online competition aimed at students made it on to our list simply due to the incredible opportunities it gives. Aside from software and hardware goodies, this year 25 internships are up for grabs at some of the best studios in the world including MPC, Framestore, Double Negative, The Mill, Method Studios, NetherRealm Studios and Monolith; all you need to do is upload the work you've created for a chance to win.

With new team-based entries including 'short film of the year' and 'game of the year' also being announced, there is no better time to apply to the CG Student Awards than 2015!




**MAIN** Students are closely mentored by industry professionals during their stay at Bournemouth University for BFX

**TOP** The CG Student Awards website for 2014 included six categories to submit to from 'next-gen gaming' to 'best school'

**RIGHT** Trojan Horse Was A Unicorn 2014 was a big success, attracting hundreds of artists from 45 countries across six continents

## SIGGRAPH

**Conference: 9 August - 13 August**
**Exhibition: 11 August – 13 August**

Where would the computer graphics industry be without SIGGRAPH? Throughout the years since its inception in 1974 by a small group of specialists, ACM SIGGRAPH has seen the debut of Pixar's first computer animated short, 'Luxo Jr', in 1986, the announcement of 3D Studio in 1995, and even the very first glimpse of ZBrush in 1999.

This year, the computer graphics and interactive techniques conference will be held in Los Angeles and include hundreds of panels, talks, technical papers, commercial exhibitions, the computer animation festival, courses and plenty more.

## TROJAN HORSE WAS A UNICORN

**16 September - 19 September**

Within just two years, Trojan Horse Was A Unicorn has gone from small-scale European festival to an event with an international status, attracting 500 digital artists from more than 45 countries to meet and learn from some of the biggest names in the industry.

Taking place in sunny Portugal, Trojan Horse Was A Unicorn 2015 will feature internationally recognised and award-winning artist and conceptual designer, Iain McCaig, senior digital artist at ILM Kris Costa, and infamous Korean artist and illustrator Kim Jung Gi – who draws without the need for any photographic references.

## BFX

**September-October**

First launched in 2012 by the UK's National Centre for Computer Animation at Bournemouth University, BFX offers a national summer competition for groups of VFX and animation students to create short sequences in just weeks, with the winning team walking away with internships at a leading UK film and visual effects studio.

A festival programme around Bournemouth also follows the competition for all other VFX professionals and enthusiasts alike, including public film screenings, in-depth workshops and masterclasses, talks and a careers hub.

## SIGGRAPH ASIA

**December**

This year's second SIGGRAPH conference will be held in Kobe, Japan, and promises to be just as packed with amazing speakers and exhibitors as its American equivalent.

# 3D printing supercars

We talk to Strakka Racing about building its latest endurance race car using 3D printing technology

**One of the most respected teams in the World Endurance Championship – where race cars are built to run at high speeds for more miles in a day than a typical F1 car would race in a year – is UK-based Strakka Racing.** This year, however, it became known for something more.

For the V8 Strakka Dome S103, the team worked with 3D printer manufacturer Stratasys to actually print out parts of the car in ABS, replacing carbon fibre pieces for the first time. "We probably didn't understand Stratasys' capabilities and their technologies as well as we should have," admits team principle, Dal Walmsley. "We as a company had never experienced 3D printing in any form other than use as a basic mock-up and historically, we've always considered it as quite a brittle and fragile material."

Today, the proportion of the Strakka team's car that's 3D printed is only about eight to ten per cent – but Walmsley explains that part of the reason was simply due to the team adapting to the new technology. All the CAD design work to create the components – which include everything from a cockpit dashboard panel to brake ducts – was created fully in Catia, then primarily 3D printed on one of Stratasys' smaller uPrint machines in ABS. This was all at a quarter of the cost and only a fraction of the time as producing pieces of the same size and shape in carbon fibre.

"I think there'll be a big increase in that percentage for race cars over the next few years," Walmsley reveals. "The area that we as the motorsport industry will see the most use of this technology will be [for] the safety-critical structural components. I think a car with a carbon fibre crash structure being replaced by 3D printed components in the knowledge that the driver will be safe in an accident, that's the direction it's going to go."

**TOP** A 3D-printed prototype next to the real Strakka Dome S103 car. Today, the car contains eight to ten per cent 3D-printed parts

**BOTTOM** A 3D-printed part for the Strakka Dome S103 would be complete in little more than a night – the same part in carbon fibre would take three to four weeks

# WIN A COPY OF iCLONE 6 WORTH £159!

## We've partnered with Reallusion to give away 6 free copies of its brand new software package

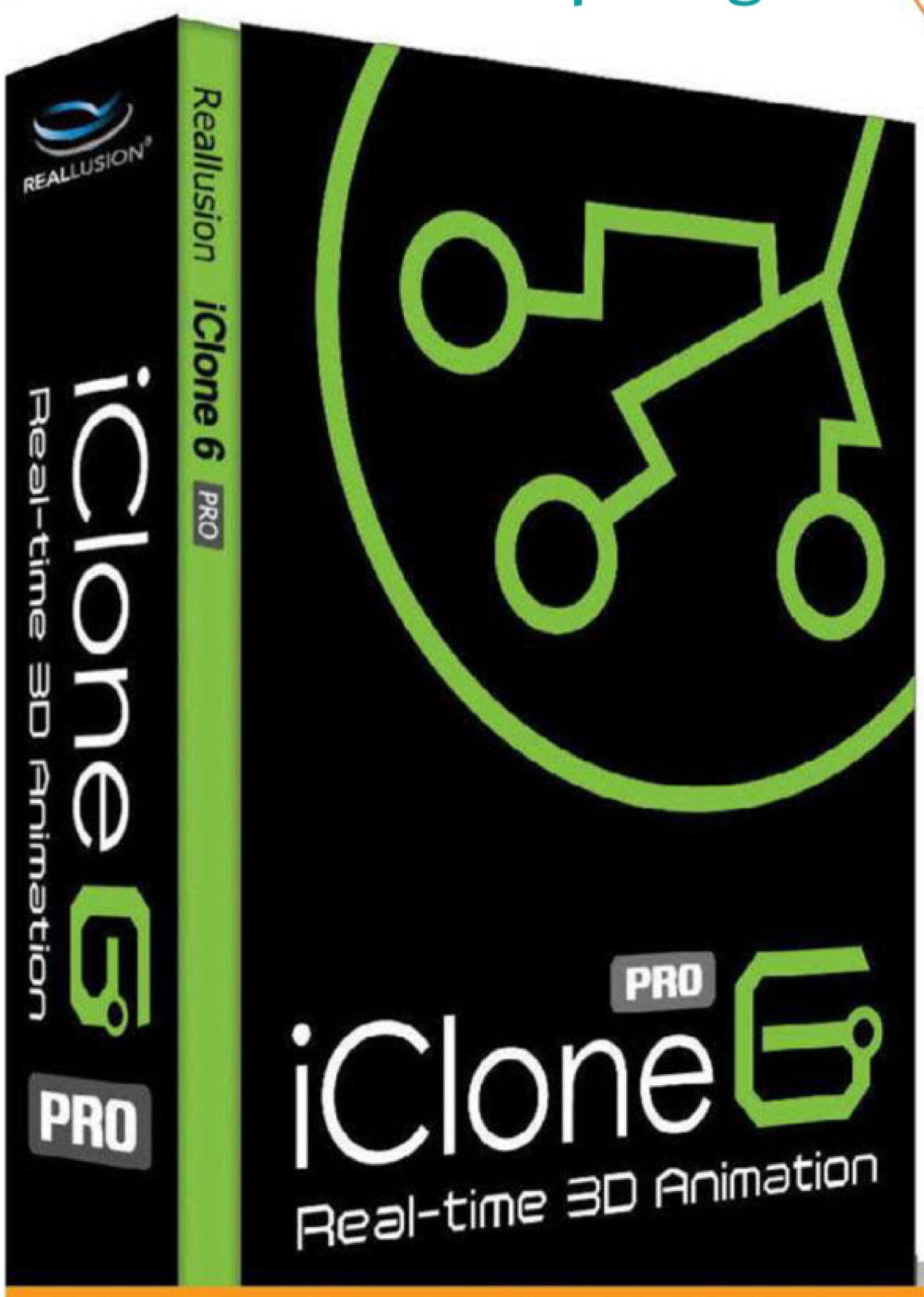
Email us at 3dartist@imagine-publishing.co.uk

**To celebrate the upcoming launch of Reallusion's iClone6, we're offering six lucky readers the chance to get their hands on a copy of the real-time 3D animation toolset.** iClone6 features refined 3D scene and animation tools, new ultrarealistic rendering plus a cinematic all-in-one editing environment for filmmakers, animators and storytellers. iClone6's new flexible UI has settings for creating instant layouts in Animation or in Visual Effects, or you can set up your own customised UI workspace. Apart from the vast visual and usability improvement, iClone6 is empowered by lots of exciting features that are a direct result of months of collaboration with many, industry-leading real-time technology partners: Allegorithmic Substances, IDV SpeedTree, Nvidia PhysX and Indigo Render. For more information on iClone6, just head over to www.reallusion.com/iclone/14-ic6_preorder/index.html.

To be in with a chance of winning your copy of iClone6, answer the following question and send it to our usual address: 3dartist@imagine-publishing.co.uk
Entry for the competition closes on 4 February 2015.

**What is the process of generating a less dense mesh for a model called?**

a) Rigging
b) Retopology
c) Painting




REALLUSION

Reallusion Community is one of the largest content marketplaces.

Reallusion is not only a 3D animation software provider with 300,000 content items in 14,000 packs, but it is also steadily becoming one of the largest real-time content marketplaces for instant animation resources. With top-selling game content providers – Dexsoft, Quantum Theory Entertainment, Protofactor and Necturus – iClone users can take advantage of using high-quality characters, scenes and props in their own projects.

## WIN 6 COPIES OF REALLUSION'S iCLONE 6 (£954)

### About Reallusion

Reallusion is a leader in the development of 3D cinematic animation tools for consumers, students and professionals. Recognised as an industry pioneer, the company provides consumers with easy-to-use avatar animation, facial morphing and voice lip-sync solutions for real-time 3D film-making and previsualisation for professional postproduction. Reallusion's core technologies are widely used by consumers, educators, gamers and filmmakers to ready their desktop and mobile devices with a total real-time animation studio that plugs in to the gamer mentality with videogame-like play-to-create technology. Professional content developers equip their studios with Reallusion technology to streamline production efforts to match the demands of animation. Reallusion is a trusted digital imaging and mobile 3D development partner to Brother, Panasonic, Nikon and Skype with embedded applications in leading consumer devices. For more information, visit **www.reallusion.com**.

**TERMS AND CONDITIONS:** Imagine Publishing and its partners have the right to substitute the prize for a similar item of equal or higher value. Employees of Imagine Publishing, Reallusion, their relatives or any agents are not eligible to enter. The editor's decision is final and no correspondence will be entered into. Prizes cannot be exchanged for cash. From time to time, Imagine Publishing or its agents may send you related material or special offers. If you do not want to receive this, please state so in an email to 3dartist@imagine-publishing.co.uk. All entrants agree to participate in any promotion related to this competition. The competition closes on 4 February 2015.

# NVIDIA® QUADRO® ACCELERATE YOUR CREATIVITY.

Accelerate your creativity with NVIDIA® Quadro®— the world's most powerful workstation graphics.

Whether you're developing revolutionary products or telling spectacularly vivid visual stories, Quadro gives you the performance to do it brilliantly.

| | | | |
|---|---|---|---|
| NVIDIA Quadro K6000<br>VCQK6000-PB | | NVIDIA Quadro K2200<br>VCQK2200-PB | |
| NVIDIA Quadro K5200<br>VCQK5200-PB | | NVIDIA Quadro K2000DVI<br>VCQK2000DVI-PB | |
| NVIDIA Quadro K5000 MAC<br>VCQK5000MAC-PB | | NVIDIA Quadro K620<br>VCQK620-PB | |
| NVIDIA Quadro K4200<br>VCQK4200-PB | | NVIDIA Quadro K420<br>VCQK420-PB | |

Learn more **www.pny.eu/quadro** & **pny.quadrok-selector.com**

Insight
uk.insight.com
Tel: 0844 846 3333

Misco
www.misco.co.uk
Tel: 0800 038 8880

Dabs.com
www.dabs.com
Tel: 0870 429 3825

Scan Computers
www.scan.co.uk
Tel: 0871 472 4747

PNY® Professional Solutions

**NVIDIA Quadro® / Tesla® / GRID™ / Prevail SSD**

NVIDIA.

© 2014 NVIDIA Corporation. All rights reserved. NVIDIA, the NVIDIA logo, and Quadro are trademarks and/or registered trademarks of NVIDIA Corporation. All company and product names are trademarks or registered trademarks of the respective owners with which they are associated.

A

**Share your art**
Register with us today at
3DArtist online.com
**www.3dartistonline.com**
to view the art and chat to the artists

# Images of the month

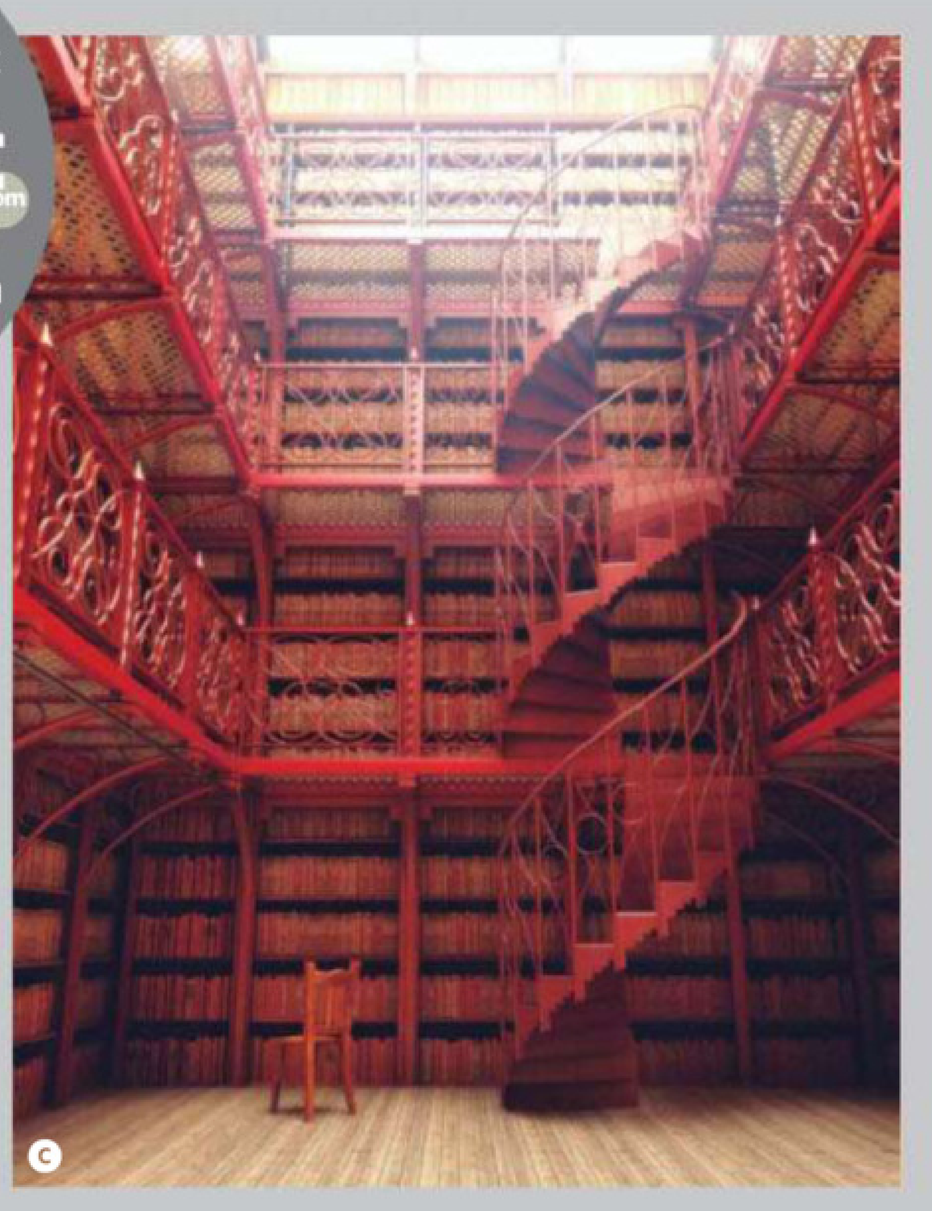
These are the illustrations that have been awarded 'Image of the week' on 3DArtistOnline.com in the last month

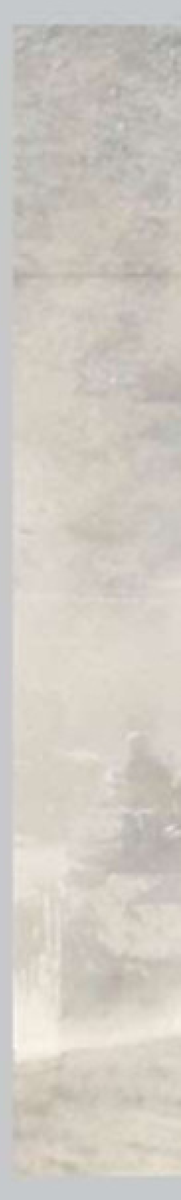
### A Sniper Bob
» **Victoria Passariello**
**3DA username** vitrux
**Victoria says:** "I created this image as a personal project in order to practice modelling and textures, based upon the awesome original concept that was created by Rune Holst Månsson."
**We say:** *Looking like a cross between something from the games Portal and Borderlands, Victoria's design has buckets of character and shows off her modelling skills to boot. We love the little details, such as the lens flare coming off the lights and the minute details on the character's body.*

### B Sentient
» **Riyahd Cassiem**
**3DA username** riyahdc
**Riyahd says:** "This is a mech character concept, part of a personal sci-fi project about AI robots. I used ZBrush for sculpting, KeyShot for rendering and Photoshop for post-production work."
**We say:** *Riyahd has done an exceptionally good job creating something that is conceptual and artistic, while still keeping an eye on technique and precision. The balance between the two is incredible. There's something incredibly mysterious about the image as a whole which, for us, is a good thing.*

### C Library Painted Red
» **Wing Wai Sze**
**3DA username** ForgottenWorld
**Wing says:** "This image was based on a real library in the Netherlands. The original library has such a great mood that it inspired me to create a library that can recapture that atmosphere in full 3D."
**We say:** *Implanting colour where you wouldn't usually find it is such a great concept. Painting the library red makes this image truly unique, and the detail of the wider environment is superb.*

### D Apache AH-64D Longbow
» **Xuesong Wang**
**3DA username** stanleyw
**Xuesong says:** "This was my final project at Escape Studio – merging CG objects with a real-life photograph and balancing the two to achieve the most realistic result. It was done in Maya, Photoshop and NUKE."
**We say:** *Xuesong's fearsome Apache is certainly eye-catching, and we love the way that you can make out neat little details that give the image a sense of context, like the dust obscuring the windows at the front.*


C



# Image of the month

## Protean Drive

» **Augusto Olarte del Castillo**
**3DA username** Bonhart
**Augusto says:** "I love to create hard-surface models, and in this case I was looking for the chance to create an industrial design model with all of its inside parts. The model was done with MODO 801 and Photoshop."
**We say:** *Augusto's render is crisp, clean and well thought out. This image further proves that technical illustrations don't have to be drab to get the job done, with the flashes of colour contributing loads to the overall image.*

## Warehouse loft

» **Eduardo Manuel Fernandes Câmara**
**3DA username** camara
**Eduardo says:** "I always wanted to do an industrial loft. This image is part of a personal project to take a break from my freelance work that I made with Blender and Cycles."
**We say:** *Although Eduardo has done an excellent job of creating some enviable arch vis, what is also of note is his careful attention to lighting. Great stuff.*

## Exist

» **Kashi Suraweera**
**3DA username** Kashi
**Kashi says:** "This is a creature design that I made with ZBrush, 3ds Max, V-Ray and Photoshop. More of my work can be found at **www.facebook.com/Zpixelss**"
**We say:** *It certainly isn't the most attractive of creatures, but Kashi's strong texturing abilities are undeniable! It's easy to imagine how these textures would feel to the touch, which is a massive plus.*

## The Beach

» **Arpan Jyoti Mahanta**
**3DA username** ArpanJMahanta
**Arpan says:** "The image consists of three models I created using Wings 3D and Rhino. The final scene, inspired by the Sixties rock music scene, was rendered in KeyShot and uses the environment Playa Sunrise from **www.hdrlabs.com/sibl**."
**We say:** *A strong creative vision and a spot of nostalgia have helped Arpan to create this stunning image, the use of accurate reflections is a particular highlight.*

RebusFarm
Render Service

# Get the Renderpower of 3000 CPUs
## into your Desktop

www.RebusFarm.net

Making your deadline in time was never cheaper, easier and faster than now!

- Best price
- No waiting time
- Advanced apps and plugins
- All major software packages supported
- 24/7 processing and support

**35€**
**Free Trial**
Only for new registrants.
**Bonus Coupon Code:**
3DA-NY-7Q7395JX

RebusFarm
Render Service

# Render Farm 2.0

## *easier, faster, safer*

FEATURES

- easier and faster workflow
- web-based control and new mobile app
- improvements in transfer speed and reliability
- secure ssl encryption
- everything runs in the background
- automated updates
- notifications
- Windows, Mac and Linux compatible

**www.RebusFarm.net**

# MASTERING MAX

## Five very different and talented artists reveal the secrets to character creation with 3ds Max

**I guess I started using 3D in school when I was a teenager," begins Ukrainian concept designer, Dmitriy Rabochiy.** "I found my first Cinema CD-Rom and started playing with it. I was then quite lucky to find 3D Studio Max on my friend's computer."

Immediately inspired, Rabochiy went to great lengths to learn the new software, even going as far as to start formally learning English to better understand the user manual. In time, he began working for local VFX companies and started modelling professionally. Then, he realised that he no longer wanted to just model what somebody else had already designed, but create the ideas behind the models himself. "I started to learn concept art, but it was hard because I didn't have any drawing skills," Rabochiy remembers, "But I slowly started drawing, watching how people work in 3D and learning ZBrush to prototype images."

Today, Max is still very much a part of Rabochiy's impressive sci-fi inspired workflow and has been his primary concept creation tool for a roster of international clients for five years. When it comes to character creation, however, the nearly 25-year-old application is capable of far more than just robots and mechs.

From photorealistic humans and exaggerated portraits to futuristic sci-fi and stylised cartoon characters, we interview five very different character creators using 3ds Max today. These experts tell us more about how they use it within their pipelines, and just what makes Autodesk's original foray into the single-artist market so iconic.

### THE SCI-FI GENIUS
### DRONES AND ROBOTS

**Dmitriy Rabochiy**

http://art-grizzly.tumblr.com/

**How did you become so passionate about sci-fi designs?**

When I started, I dreamt of making monsters, but eventually I found this was more related to the

## Dmitriy Rabochiy – Artist Showcase

"3ds Max has a feature that you can install called V-Ray HDRI Map. Almost all the features you need to know about lights are all there"

"People usually expect to see something complicated in my shaders and then they see that it's just Diffuse Colour Specular and they're amazed!"

"I think I need to say thanks to Blizzard because I was playing *StarCraft* and there was awesome cinematics in the game, and I thought 'woah, I want to make this!' That's when I started to find the way to do the same"

classical, traditional art because you need to have knowledge of things like anatomy for instance. Meanwhile, sci-fi is more related to industrial design and I never imagined that I would work as a designer, but here I am!

**What are the best ways to use 3ds Max in a character-creation workflow?**

I think Max is amazing if you want to render something complicated, because there are a lot of cool renderers like Corona and they attach to it perfectly! Corona is a really marvellous renderer, faster than KeyShot. You have your powerful materials, you can just take them and press render and you're done!

I start my workflow by using 3ds Max for my basic blockouts and then throw those into ZBrush for detailing. Then I'm back to 3ds Max for retopology, connecting assets from ZBrush and exporting what was in ZBrush to KeyShot or rendering it all in 3ds Max.

**What are the main advantages and disadvantages of creating your drones in 3ds Max?**

3ds Max is one of the easiest tools to learn and it's one of the most finished pieces of software available because it was started from scratch many years ago. I've never seen such a huge amount of tutorials for any other software as there are for 3ds Max. 3ds Max is also pretty good at handling huge meshes and it is very fast when you're working on sci-fi designs.

There are, however, lots of problems with innovation of the technology, I think it should develop more quickly. It has a lot of problems with the Chamfer too. When Vitaly Bulgarov works in XSI, he can apply a Chamfer tool easily but 3ds Max creates a lot of trouble.

**What advice would you give to less experienced 3D character artists using Max?**

That the most useful tool in 3ds Max is 'Help' – people do not think it but it contains so much information! Of course you need to go through the tutorials, but the basic step-by-step stuff to learn the software from A to Z is in that file. It's awesome! I don't understand why people ignore it. People still ask stuff like 'how do I cut edges' and I just think, man, use the help file!

**"3DS MAX IS ONE OF THE EASIEST TOOLS TO LEARN AND IT'S ONE OF THE MOST FINISHED PIECES OF SOFTWARE AVAILABLE BECAUSE IT WAS STARTED FROM SCRATCH MANY YEARS AGO"**
**DMITRIY RABOCHIY**

# THE FIDELITY EXPERT PHOTOREALISM

**Hasan Bajramovic**
www.hasanbajramovic.com

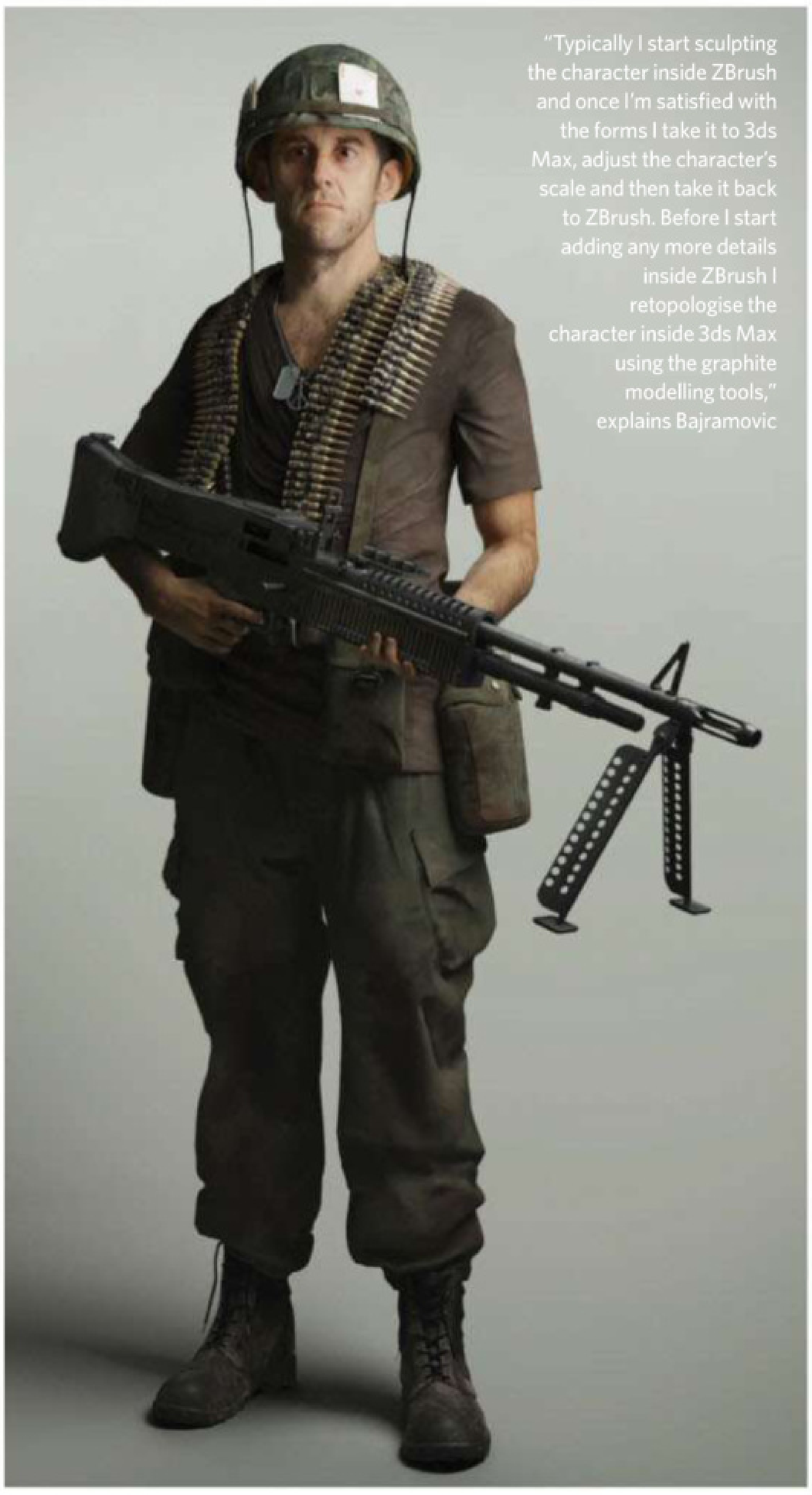
**After so much beautiful work, why do you continue using Max today?**
These days I'm actually comfortable with using most of the software that is available. Each one gets the job done even though some things might be harder to achieve in one and easier in the other. 3ds Max just does everything that I as a character artist need to do on a daily basis and I really love the modelling tools that it has. Add V-Ray to that and you're set! I also have a collection of tools, plug-ins and scripts that I'm accustomed to, so to keep the productivity going and to avoid looking through the interface of some other software I just stick with it.

**What are your favourite tools and techniques in the software?**
I pretty much like everything about 3ds Max. Starting from the interface, customisation to its poly modelling tools. Graphite tools are my favourite and I use them all the time. I also love the modifiers inside 3ds Max and the way they work. One of my favourite and most-used modifiers has to be Shell and Symmetry. I couldn't imagine my workflow without those. Spacing tool is also something that I use whenever there is some geometry that needs to be distributed along a path.

**If you could give an artist starting out today your main tips for lighting and rendering using 3ds Max and V-Ray, what would they be?**
I would say that you always need to go with a linear workflow. This is something that just has to be done. If you're not sure how to set it up and what its advantages are, I've seen a lot of great articles available online.

Lighting-wise I always use IBL in combination with some custom lights. Remember, real-world photography lighting applies to 3D. It's also good to extract frames from your favourite movies and experiment inside 3ds Max to see if you can achieve the same mood on your characters. In terms of rendering I would also suggest experimenting and reading up a bit to get familiar with all the options of your rendering engine. It doesn't hurt to know how it works.

There are quite a few great articles available out there on the topic of V-Ray rendering, including one of my personal favourites on V-Ray Optimization written by Akin Bilgic from Blur Studio. He also has a great tutorial on displacement mapping inside 3ds Max so be sure to check it out on his website at **www.cggallery.com**.



"Typically I start sculpting the character inside ZBrush and once I'm satisfied with the forms I take it to 3ds Max, adjust the character's scale and then take it back to ZBrush. Before I start adding any more details inside ZBrush I retopologise the character inside 3ds Max using the graphite modelling tools," explains Bajramovic

Soldier work-in-progress models by Hasan Bajramovic. Once he's done reprojecting all the details from his ZBrush sculpt, he creates materials with displacement mapping for his models. All UVs are created in Max

"I do have a lot of Max and Python scripts on my end," says Bajramovic. "If you're not familiar with Maxscript there is a huge collection of ready-to-use scripts from the community on **www.scriptspot.com**"

# Mastering Max

## THE FANTASY SCULPTOR MONSTERS

**Marat Ars**

http://drawcrowd.com/maratars

**Tell us a bit about your 3D art career?**

I work as a freelance digital artist from Russia. I have been working for a number of game and film companies as a 2D and 3D character concept artist and illustrator.

**What projects are you most proud of having worked on in 3ds Max?**

I think it is my personal project which has been in development for several years. It is a sci-fi short animated film that was created completely by me from script to post-FX. I'm doing it in my spare time, it's pretty slow and difficult for one person. But I still have a dream that someday I will be able to share it with the world.

I used CAT for all the characters' animation, Nvidia PhysX for simulation soft-body and rigid-body objects like debris, wires and ropes. The Cloth modifier is great for the tents, rags, cloaks and character clothing. It's very easy to use.

**What have been the main challenges and you've faced so far creating your short?**

For me that was character animation part because I was not familiar with this. I have read a tonne of tutorials and books which have improved my skills. I still have a lot to learn in this area. I don't have any opportunities to use mo-cap for the animation, therefore all of the things were animated manually such as keyframe animation.

**And finally, can you give us five professional tips for creating advanced characters using 3ds Max?**

- You don't need to learn all the tools at all, unless you are true fan of 3D and you want to learn all the things there. You can create any model you want using poly modelling only.
- Be honest with yourself. Do not rush to finish the model quickly if you have a lot of time for it. Analyse the topology and take all the time you need to improve your skills in modelling. Try to always do a clean job.
- Take time to develop your own modelling technique, balance speed and quality. This is important. As you become more experienced in this, you will do everything automatically and as productively as possible.
- Don't be lazy. Learn something that can improve your skills every day.
- Even when you've completed a great model, don't flatter yourself – you have a lot to learn.

## Top plug-ins for characters

**V-RAY RENDERER** "V-Ray has matured a lot and has proved itself as a production-quality rendering engine that is really easy to set up" **Hasan Bajramovic**

**ORNATRIX** A powerful tool for any hair and grooming needs, with native V-Ray support included

**CORONA RENDERER** "I think Max is amazing if you want to render something complicated because there are a lot of cool renderers like Corona" **Dmitriy Rabochiy**

**KEYSHOT** A simple user interface enables users to apply scientifically accurate materials, work with textures, and adjust HDRI and physical lighting in real-time

**RAYFIRE** Fragment, destroy, blow up and wreak general havoc directly in Max with Nvidia PhysX rigid-body support, an interactive demolition system and more

**FUMEFX** Fluid dynamics engine for the simulation and rendering of realistic smoke, fire and other gaseous phenomena

**KRAKATOA** Thinkbox Software's volumetric particle rendering, manipulation and management toolkit. Great for managing dust, smoke, silt, ocean surface foam and more

**HAIR FARM** The ultimate hair plug-in for 3ds Max

**MULTISCATTER** Quick generation of an array of objects right before rendering, ideal for forests and cities. Works with both V-Ray and Mental Ray

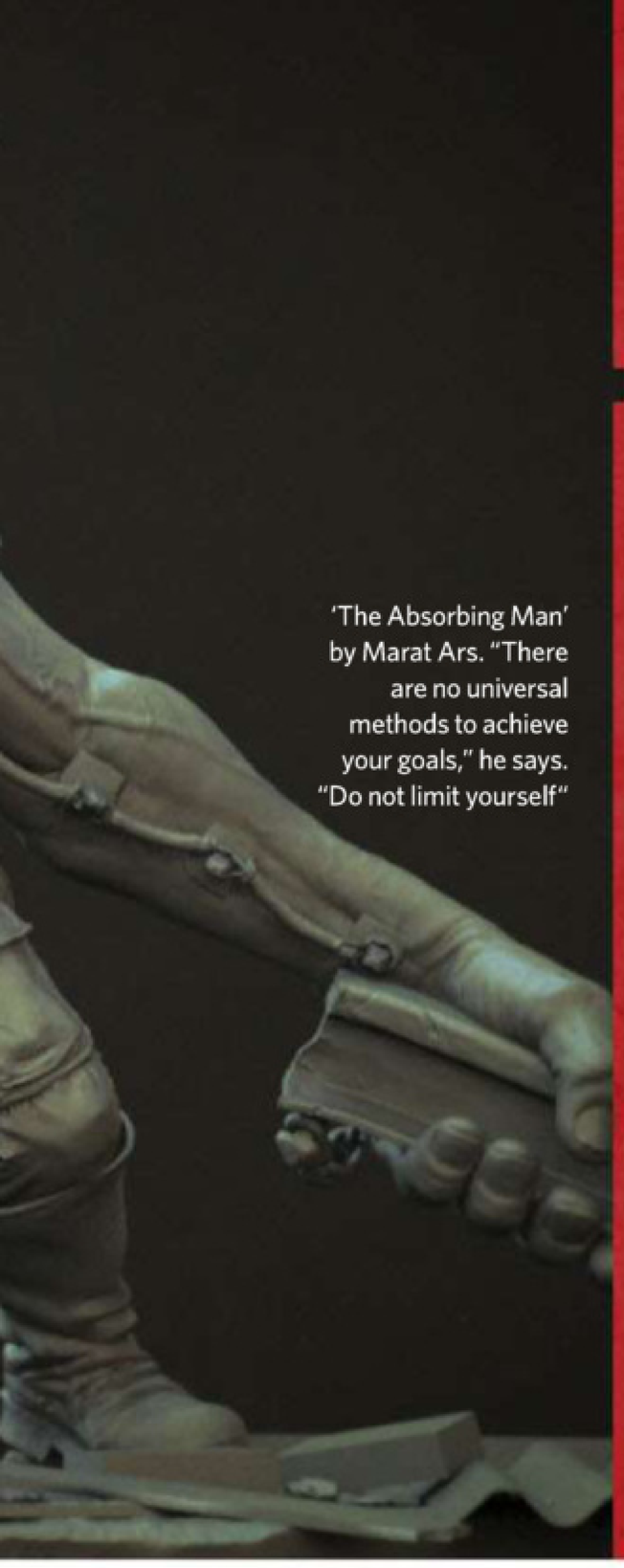
**HDR LIGHT STUDIO** Light your shots by placing light and reflections directly onto the 3D view with a dynamic HDRI map generated on the fly

**DREAMSCAPE** For creating and rendering realistic landscapes, seascapes, skies, clouds, outdoor lighting and more

**BONESPRO** "Skin binding in 3ds Max isn't the best experience ever, we all know it, but with this plug-in things can be a lot easier" **Victor Hugo**

## "ALMOST ALL OF THE THINGS YOU CONSIDER PAINFUL TO DO ARE THINGS THAT SOMEONE HAS ALREADY CREATED A SCRIPT FOR"

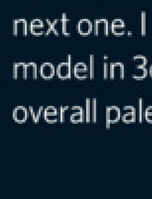
**VICTOR HUGO**



'The Absorbing Man' by Marat Ars. "There are no universal methods to achieve your goals," he says. "Do not limit yourself"

## Marat Ars – Breakdown

**01** Base mesh from 3ds Max
**02** High-poly ZBrush Sculpt
**03** Render layers: global illumination, lighting and reflection channels
**04** Post-production in After Effects



## THE SCENE SPECIALIST
## STYLISED SCENES

**Victor Hugo**
www.vitorugo.com

**Tell us what your first experience with 3ds Max was like?**
My first true experience with 3ds Max was nine years ago, when I had a job interview but didn't know anything about 3ds Max. So, I asked the recruiter for a week to solve previous job issues before I started my test period – and of course I was lying, since it was my very first job and I asked for that week in order to actually learn something about 3ds Max!

After the test period, which miraculously I passed, I started to get more used to the software and things started to become more fluid. Since 3ds Max has a large plug-in/script library, I never really felt the need to migrate to another app. I know a bit of Maya and Modo, but I'm pretty happy with 3ds Max. It fulfils my needs!

**Could you tell us more about how you would typically use Max in your workflow?**
My workflow is pretty messed up! I develop something that I call an 'organic workflow' – I don't wait to finish one step of the process to start the next one. I first block a really rough composition or model in 3ds Max with some colours to feel the overall palette, meanwhile I'm already dropping it into Photoshop to do some painting over and test post-production ideas. The same goes for when I'm modelling, texturing and rendering. That back and forth process helps me a lot when it comes to foreseeing what I can do in 3ds Max or what I can do in Photoshop.

**After winning so many awards and with so much experience in CG, what would your five top tips for creating original characters with Max be?**
**1.** Get used to the software.
**2.** Don't underestimate old-school modelling.
**3.** Graphite tools and staking modifiers. This is the absolute real deal when it comes to 3ds Max modelling power.
**4.** Don't be like me, who took far too long to migrate to the node-based material editor: it's completely and totally awesome.
**5.** Almost all of the things that you consider painful to do are things someone has already created a script for. Vertex Killer, RenderMask, Relink Bitmaps and imageCompHelper are some of the scripts I really like to have to hand.

**What would you say are the main advantages and disadvantages of creating and animating characters with 3ds Max?**
The main disadvantages are the Skin modifier – it's so painful! Maya users tend to complain about animation curves and rigging, but I've never had problem with curves, but then again I have never animated in Maya either. There's also a lack of decent autorigs – CAT could be way better and sometimes it feels like the huge plug-in library is due to a lack of default features!

The main advantages are a nondestructive workflow, stacking modifiers, particle flow, Graphite Tools, modelling in general, the fact that there are lots of tutorials around the web and the huge plug-in and script library.

# Mastering Max

Final 'Angry Old Man' render by Mohanad Hossam. "It's not about the software you use," he says. "The thing you need to make sure of every time is just your passion – how you love your work and how to keep it that way after one, two or three years doing 3D"

## Mohanad Hossam – 'The Old Man' Breakdown

**1.** After the render I saved the image as an EXR file. This gives you a 16-bit or 32-bit floating point image – more colour data to deal with in post-processing.

**2.** When opening the file in Photoshop you get a bright image, which you can fix using Levels. I downgraded the image from 32-bit to 8-bit and merged.

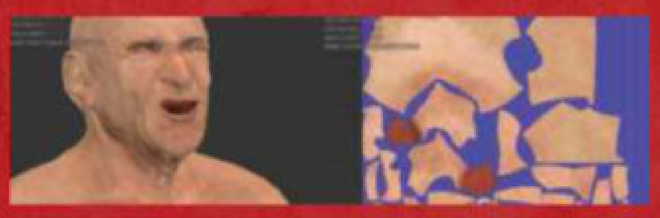
**3.** Merging layers automatically opens the HDR toning menu, useful for modifying the Gamma and Details tabs while balancing the Exposure and Highlight tabs. You can notice the difference between the two sides before and after using HDR.

**4.** To create the glass, I needed to pay attention to the IOR, because in refraction the higher value gives the feel of thick glass. An IOR with the value of 4 will be fine. The reflection and refraction material was a dirt map I created in Photoshop. I then altered the map's opacity to control its strength. I used 3ds Max Hair and Fur for the piece of fabric on the glasses. The material was just a diffuse map and a bump map here.

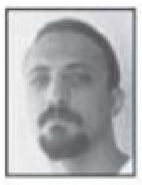
**5.** For the eyelashes I created a Spline around the eyelid, turned it into an editable poly before adding a Hair and Fur modifier and styled with the Hairbrush.

**6.** For the lighting, first I added a Dome Light with an HDRI map to give some variation in colour around the character. The multiplier was 0.2. Next, an upper light with multiplier 30 was used to give the wrinkles more definition and contribute to the expression. The third light on the right side was used as a softbox.

**7.** For the skin shader I used a V-Ray Blend material with a V-Ray Fast SSS2 as a base and a V-Ray Standard Material as a Coat with a mix map to blend shaders. The Coat material is a Standard V-Ray shader with a skin texture in the Diffuse and the same bump map in the SSS2 Base shader but with the multiplier at two.



**8.** The texturing process was done in MARI. The UVs were generated inside Unfold 3D, then imported to the base mesh inside ZBrush via UV Master.



## THE NEW TALENT PORTRAITS

**Mohanad Hossam**
http://mohanad_hossam.artstation.com

**Could you tell us more about yourself?**
I have been working with Max for about three years, maybe less. It started when I went to attend a Max course and I loved it – I became very passionate about learning more. 'The Old Man' was my first attempt at making a 3D portrait!

**Can you explain how you first began working on 'The Old Man'?**
First it was a study in expressions. Before I was doing 3D I was drawing portraits, so I'm very interested in the fine art of it all. I also find an expression way more interesting to sculpt than an unemotional face.

I used 3ds Max for hair, fur and for the eyelids, and then I used it for shading using V-Ray and for the final render.

**Was it a challenge moving from 2D to 3ds Max?**
It was, because in 2D you just create what you see and then it's over! When you're working in Max and ZBrush, you rotate the model and get shocked because you haven't seen that bit yet.

**How about creating the shader for The Old Man's skin?**
I just watched some tutorials on YouTube from artists who make portraits and I tried to understand the general concepts behind using the V-Ray SS material. It's really sensitive as a shader so I just gave it a try, and wasn't sure what I was going to have at the end!

So I tried several times before I realised that I needed to mix in two more materials to have that realistic shader, so I just mixed the V-Ray SS with a standard V-Ray material and created bump maps and the reflection maps – it's worked well I think!

**Do many other artists use Max in your country?**
It's very hard to find a 3D artist in my country, Egypt, and every time the people who do things just tell you 'it takes a long time, we learned for six or seven years before we could do it'. We also just don't have the kind of schools that teach you how to use this software. We just have very simple courses that give you the basics like with the 3ds Max course I attended where the most extreme thing you do in this course was put a sphere on the plane and press render! We were asking ourselves 'what are we doing here?'

**How about the future?**
I hope that I can do something useful in the future. Working out of the country or in the country or anywhere – I just hope I can do something useful in the place I'm going to and create some benefits for the people.

DOMAINS | MAIL | **HOSTING** | eCOMMERCE | SERVERS

# NEW HOSTING

## TOP APPS NOW EVEN BETTER!

### WordPress and more with 1&1!

- Easy installation with 1&1 WP Wizard
- **1&1 Expert App Support 24/7**
- Evaluation version for all applications
- Security notifications and automatic updates
- Up to 2 GB RAM guaranteed
- Optimised for WordPress and over 140 more apps (Drupal™, Joomla!™, TYPO3…)

### Powerful Tools

- NetObjects Fusion® 2013 – 1&1 Edition included
- 1&1 Mobile Website Builder
- **PHP 5.6**, Perl, Python, Ruby, ASP.NET and more...

### Successful Marketing

- 1&1 SEO Pro
- 1&1 Search Engine Marketing
- Facebook® and Bing® credits
- 1&1 Newsletter Tool

### State-of-the-Art Technology

- **Geo-redundancy** for maximum availability
- Over 300 Gbit/s network connectivity
- 1&1 CDN with Railgun™

### All Inclusive

- Free domain for package lifetime (.co.uk, .com, .net...)
- Unlimited power: Webspace, Monthly Traffic, E-mail Accounts and MySQL Databases

## COMPLETE PACKAGES

Starting at **£0.99** per month* excl. 20% VAT

1 TRIAL TRY FOR 30 DAYS

1 MONTH SHORT TERM CONTRACTS

1 CALL SPEAK TO AN EXPERT

0330 123 0274

1&1

1and1.co.uk

* 1&1 Basic £0.99 per month for 12 months with 3 month billing cycle, paid in advance, then regular price applies. Prices exclude 20% VAT. Visit www.1and1.co.uk for full offer details, terms and conditions. Rubik's Cube® used by permission of Rubik's Brand Ltd.

# Technique focus

**Incredible 3D artists take us behind their artwork**

**STRUCTURE** I began experimenting with Structure Synth to generate structures similar to organic growth. Using Blender's DupliFaces replication feature, I dug out this remeshing mishap to experiment with the varieties in topology-based distribution of the replicated objects. I remeshed the object to achieve a honeycomb-like topology. **Pearlish Amorphoid,** 2014

Martin Bässler

3DArtistonline

**Username:** martinius

**Website** www.artisargentum.de/MartinBaessler

**Country** Germany

**Software used** Blender, Cycles, Structure Synth, Photoshop

# www.scan.co.uk

t: 01204 47 47 47 **3XS SYSTEMS PRO GRAPHICS** SCAN COMPUTERS

## Creative results are built with creative hardware

## On spec. On budget. On time.

Award-Winning Scan 3XS Graphics Workstations.

### **Scan 3XS GW-HT15** Custom Built Workstation

Graphics & CAD workstation with NVIDIA Quadro K4200 graphics and an Intel Core i7 5820K CPU.

- Intel® Core™ i7 5820K, Overclocked to 4.2GHz.
- Asus X99-S Motherboard, Intel X99 Chipset
- 4GB NVIDIA Quadro K4200 - Supports 4 displays
- 16GB Corsair Vengeance LPX DDR4 2666MHz
- 120GB PNY Prevail Solid State Drive
- 2TB SATA3 Hard Drive
- 3 Year Premium Warranty

THIS SPEC, FROM **£2057** Inc VAT

intel inside™ CORE™ i7

### Building success

Speed and efficiency are the building blocks of a successful project, and a graphics workstation must deliver both. Ultimate performance, accurate calculations, low power consumption and rock-solid reliability are the hallmarks of a Scan 3XS graphics workstation.

Don't buy hardware without Scansure protection. Insure yourself with 28 day installation damage www.scan.co.uk/scansure

SF Scan Finance. Pay 10% deposit now, spread the remainder over 36 or 48 months. Scan business lease. Spread your business expenditure over 24 or 36 months.

Intel, the Intel logo, Xeon and Xeon Inside are trademarks of Intel Corporation in the U.S. and other countries.

Classic credit options (36 or 48 months). Customers will initially only have to pay a 10% deposit, with the orginal loan amount payable over 36 or 48 months. *Example: £1,000.00 Deposit: £100.00 Amount of loan: £900.00 Total charge for credit: £276.12 Total payable:£1276.12 Total 36 Monthly instalments of £32.67 APR:19.9%. Terms and Conditions Apply

# 24 TRICKS FOR BETTER LIGHTING

## Achieve stunning lighting in your 3D renders with these tips, tricks and fixes from industry experts

**When asked how to create the perfect, original 3D character, it's only natural to think of areas of the pipeline such as pre-production, design, and modelling – perhaps how the character might need to look to work for the story, or the brushes needed to sculpt it effectively.**

What is often overlooked, however, is ironically one of the single most important things that an artist can learn. It's an area that can make the difference between the character looking realistic or synthetic, sinister or relaxed: the lighting. If, for you, lighting is a stage in the production process that involves placing random lamp types in the scene and hoping they look good and relying on the render engine to do all the work, you are definitely not alone. But just as we will all instinctively recognise a 3D human from a real one due to issues in modelling or texturing, so too will we subconsciously recognise real light.

It's being able to harness that light – the way it reflects, refracts, changes colours or creates shadows, and how everything from a key light to an HDRI can let you recreate it – that can make a huge difference to 3D work. To help, we've hand-picked some of the most impressive artists lighting their scenes today to give us their top 24 tips on how to take your work to the next level.



*Medieval Knight* by Thomas Cairns

# 24 tricks for better lighting

## CONTRIBUTORS

**Jonathan Ball**
Illustrator and founder of Poked Studio
**www.pokedstudio.com**

**Waldemar Bartkowiak**
Senior modeller at ILM
**www.artstation.com/artist/mancubus**

**Kevin Beckers**
Senior 3D artist at INDG.nl
**www.cargocollective.com/Tycane3D**

**Thomas Cairns**
Student **www.thomas-cairns.com**

**Aris Michailidis**
3D artist at Nox-3D
**www.3dartistonline.com/user/aris**

**Jason Scott**
Lighting supervisor at Rhythm & Hues
**www.thescottclan.org/jason**

**Ivan Stalio**
Freelance illustrator **www.ivanstalio.com**

**Mostafa Zaki**
3D artist **www.MoMaZa.com**

## Research

01 **Observe how light works in the real world** How it bounces, how coloured light affects coloured surfaces, and so on. Sometimes it does what you least expect. **Jason Scott**

02 **Learn to read photographs** Get books from great photographers like Jimmy Nelson, Roger Ballen or whoever's style you fancy and have them laying around your work desk to pick up when you are lost, when your computer is rendering, or whenever you have a spare moment. Then start learning to read the photographs, as there is a lot of information you can get by really studying a picture. Looking at shadows and speculars in a picture can help you figure out what light setup has been used, and what lights serve what purpose. Some lights might serve to separate the subject from the background, while others might serve to attract the viewer's eye to a specific point in the picture, for example. **Kevin Beckers**

03 **Get your shaders ready first** Don't rig your lights before you make sure all your shaders are ready – lighting a scene without shaders is a waste of time. Start by using a very simple light – no GI, just simple area light – to see how your shaders will act. Then, when all your shaders become ready, think about more. **Mostafa Zaki**

04 **Read photography magazines** Aside from reading 3D-specific industry magazines, it is also a good idea to read up on other industry publications, like photography titles. They often deal with lighting and composition topics and also have some good tips and tricks on post-production that can help to take your 3D renders to the next level. **Kevin Beckers**

05 **Don't be slave to photographic realism** You can use photographic references to understand how stuff works, then remember to be creative, you are the artist, you have to bend the light to your needs! **Ivan Stalio**

## Lighting set-up

06 **Take the time to set up basic lighting** Before starting to set up complex materials and textures, take the time to set up a basic form of your intended lighting setup to get a better idea of how the light will affect the final composition. I will typically only include the basic diffuse, glossy and transparent shaders when testing the lighting. Setting up the basic lighting early on can prevent issues such as having to modify or rearrange models after they are textured and can be a big time-saver. It is also a great opportunity to experiment with new lighting setups that you haven't tried before, since render times will be quite low. **Thomas Cairns**

07 **Start with the light that has the smallest effect first** Many artists have said this before, but it's one of the most important things you need to become a good lighting artist. You can't see the effect of the smallest light if you start with the biggest one. If you test all your lights step by step, then you will not have any problems with a complex setup. **Mostafa Zaki**

08 **Strip back and get your primary lighting right** Sometimes you add so many lights you don't how each is affecting your scene. Strip back to one, get the angle and intensity where you want it, and start adding extra fill lights back in. **Jonathan Ball**

09 **Keep experimenting** Try different kinds of lights. I usually change my lighting setup every time – I really like to experiment. **Ivan Stalio**

10 **Use contrast** Contrast in lighting will make your scene dramatic and interesting. Try using warm colours against cold ones, or using one huge light source on one side balanced by multiple small lights on the other. **Waldemar Bartkowiak**

11 **Vary your colours** Remember that even while you are using the same light, you can use different colours in your specular channels or maps, simulating different coloured lights and getting original results. **Ivan Stalio**

*The Rain Umbrellas* by Aris Michailidis. He used his knowledge of lighting to create a morose atmosphere

Tip 07

**12 Build up a composition** Use the lights to build composition of the image. Brighten areas you want to be seen and guide the viewer's eyes across the image using light rays. To create the moonlight effect in 'Master of the Books', I used three lights placed in the same spot, just above the hole in the ceiling, all pointing downwards:

- A Spotlight with a slight blue tint, with five-degree cone angle and intensity at around ten per cent. It's main purpose was to light the floor and illuminate the main elements in the centre from the top.
- A Large Area Light, bigger than the size of the hole in the ceiling. This light has a dark blue colour and high 180 per cent intensity with the falloff using Inverse Distance Squared setting, which reaches the bottom of the library. It fills the whole room with soft blue light in a gradient pattern. Use of large area light allows me to draw nice, soft shadows.
- The last light is a Distant Light, for the volumetric lighting. It doesn't affect diffuse or specular, its role is to create a pillar of light, shooting from above the whole scene, through the hole, down to the ground. The intensity of the light is set to 100 per cent, the Effect Dissolve value is set to 20 per cent, and the rest of the settings at default. The radius of the light is roughly the same size as the hole, but really tall, with the length being twice as big as the whole library. This helped me get desired falloff, especially with such an extreme camera angle. I choose pure white, with lots of shades of blue already illuminating the upper parts of the library, it makes the rays stands out more. **Waldemar Bartkowiak**

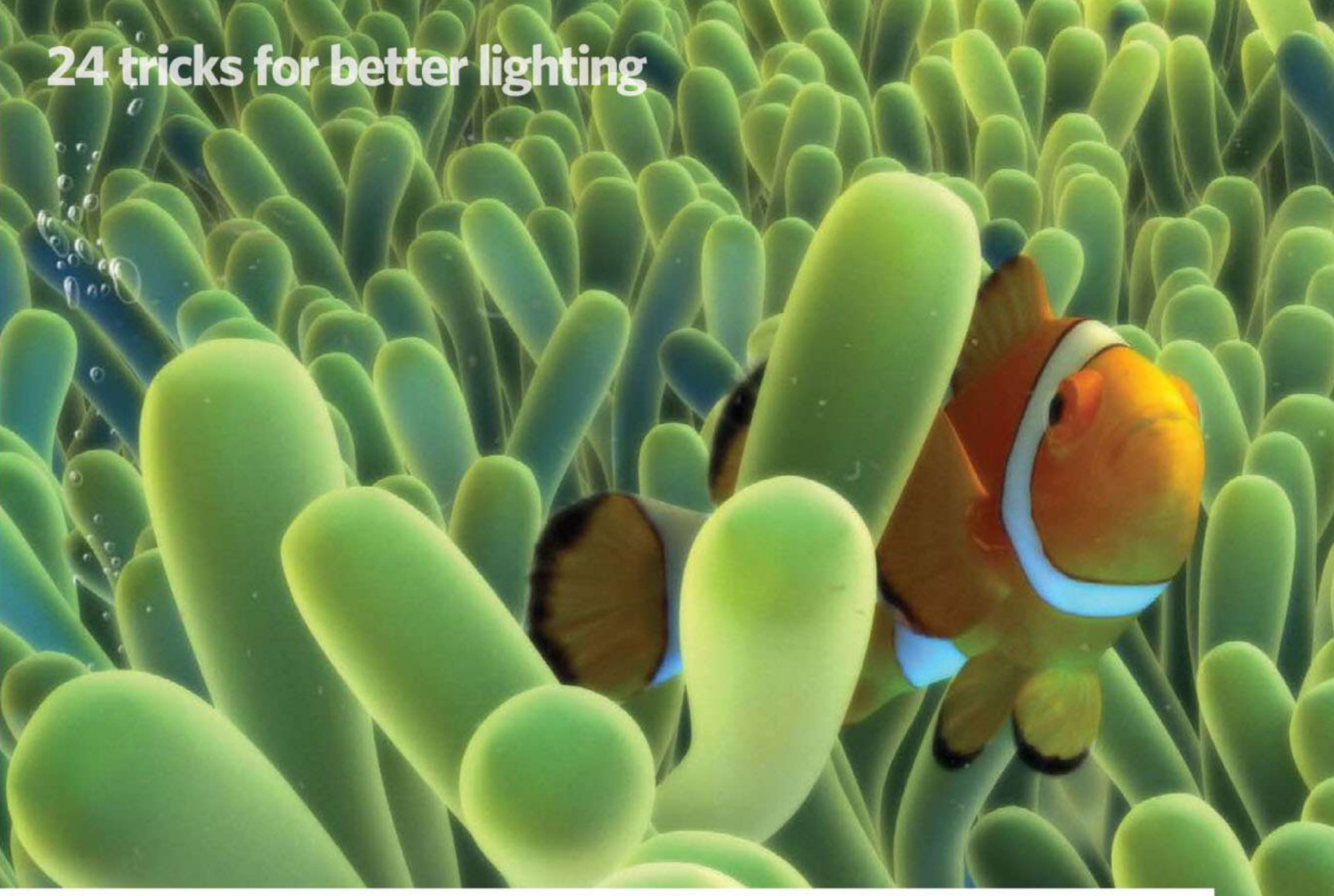
Tip 12

The full 3D scene of Mostafa Zaki's BMW Sheer Driving Pleasure project, showcasing all the lights that were used

## Using HDRIs

HDRIs, or High Dynamic Range Images, allow for real-world light data to be captured and integrated into a 3D scene for realistic environment reflections and overall results. They're usually created by taking different exposures of the environment and then combining them to showcase all the light and shadow information from the scene.

# 24 tricks for better lighting



## Basic lamps

**Spot light**
Shines a beam of light evenly within a range defined by a cone, the size of which determines how broadly the light will reach in the scene.

**Area light**
A physically-based light that shines equally in all directions to one side of a set boundary, such as a plane or rectangle. These lights can take longer to render compared to other light sources, but can also produce great results.

**Directional light**
Normally meant to represent an extremely distant light source such as the sun or the moon, these shine evenly in only one direction and affect everything in the scene.

**Point light**
Casts light out in every direction from an infinitely tiny point in 3D space. This type of light is great for light bulbs, stars, or even Christmas tree lights.

**Volume light**
Like the Point light, the Volume light also casts light out in every direction, but a volumetric light has a particular shape and size. This creates a huge advantage for users as they have a visual representation of the extent of the light, making its falloff much easier to control.

**Ambient light**
Used to simulate the combination of direct light and indirect light, this uniformly brightens your objects but can result in an unrealistic final effect.

## Effects & shadows

13 **Setting up your gamma** This is very tricky for many artists – physically gamma should be 2.2 but this amount wouldn't normally give you the result you want. I would use a gamma of 1.6 or 1.8 or 1; remember, you can bend the real physics in your world – it all depends on what you need. **Jason Scott**

14 **Don't be afraid of dark areas** Not everything has to be lit – dark areas add atmosphere. I often get annoyed when watching films that have scenes set in the dark, caves or unlit rooms, for example, and they have added a low level light so you can see everything. That ruins the entire atmosphere. **Jonathan Ball**

15 **What you can't see is as important as what you can** Learn to embrace both darkness and shadow. **Jason Scott**

16 **Remember off-camera lights** Imagine a city scene at night, you are rendering a small section of buildings within that city. In reality that scene will be affected by lights from buildings, cars, neon signs and so on that are not visible in the main scene, but are adding subtle secondary light or reflections to it. Add some lights off camera to simulate this. **Jonathan Ball**

17 **Use volumetric lighting** Volumetric lighting, when not overused, can be an easy way to add some extra interest to your scene's light setup. It is especially useful in interiors and can be combined with obstacles in the light's path to both add interest to the scene and to focus the viewer on the main subject. **Thomas Cairns**

18 **Introduce complexity to shadows** Whenever it makes sense to do so, try to introduce extra complexity to the shadows of your scene. Even though the environment outside an interior scene may not be modelled, it can add extra interest to the shadows of your scene if alpha-mapped textures such as foliage or raindrops are placed in the path between the light source and interior scene. In Blender I like to use a spot lamp set to a very high strength with a small 'size' value to better show off small details from shadows cast by alpha-mapped patterns in front of the light source. **Thomas Cairns**

19 **Break up the light** Breaking up a light, for example by putting a noise map in the projector map in 3ds Max, or placing a 'tree billboard' in front of your light, can help break that CG feel you get as the light will have subtle intensity variations, as apposed to this perfect uniform light a CG light gives. Heavy or light dirtmaps in specular or bump slots will also help break said uniformity. **Kevin Beckers**

**20 Using luminous polygons** I like to use luminous polygons – or lumigons – in Modo to create detailed lighting setups. I usually don't accept my image as complete with just a regular photorealistic light, even if I'm working on an outdoor scene. Sometimes, in addition to the sunlight, I use some more lights because I want to get a shaded area to be more readable, or highlight a particular element or a detail. **Ivan Stalio**

*Anemone* by Italian illustrator Ivan Stalio, created using Modo. He doesn't have any preferred lighting setup, preferring to experiment with something new every time

# 24 tricks for better lighting

**21 Add dust particles floating in the air** It could be done using particle systems, or simple geometry with alpha planes and works quite well when combined with volumetric lights. Those particles will get picked up by all your light sources, adding a final touch to your render. **Waldemar Bartkowiak**

**22 Create colour effects** In Blender I often create planes with an emission material and a strong colour for my lights. I then use another plane facing an opposite direction with a contrasting colour and a lower setting. This creates interesting colour effects in your scenes. **Jonathan Ball**

**23 Adding fog** Don't be afraid using volumetric lighting and of adding a bit of fog to your scenes. It will not only add depth to your image, but also it helps build a mysterious atmosphere. You can also add some quick smoke effects by just adding some simple texture in your volumetric lights settings. Good examples of this kind of effect might be light coming through the window blinds in dusty room, or rays cast through a hole in the clouds. Thanks to their interaction with the environment these lights are much more exciting and captivating. **Waldemar Bartkowiak**

**24 Post processing** There is no doubt that post is one of the most important things that any 3D artist should know, but don't count on it. Use lighting to try to make the best results come directly from your 3D app. Even if you are rendering just passes, make all your passes look beautiful. Don't wait until you go to post. **Mostafa Zaki**

*Atomic Train* by Poked Studio's Jonathan Ball. Not being afraid to use colour is an important way lighting in 3D scenes can look more realistic

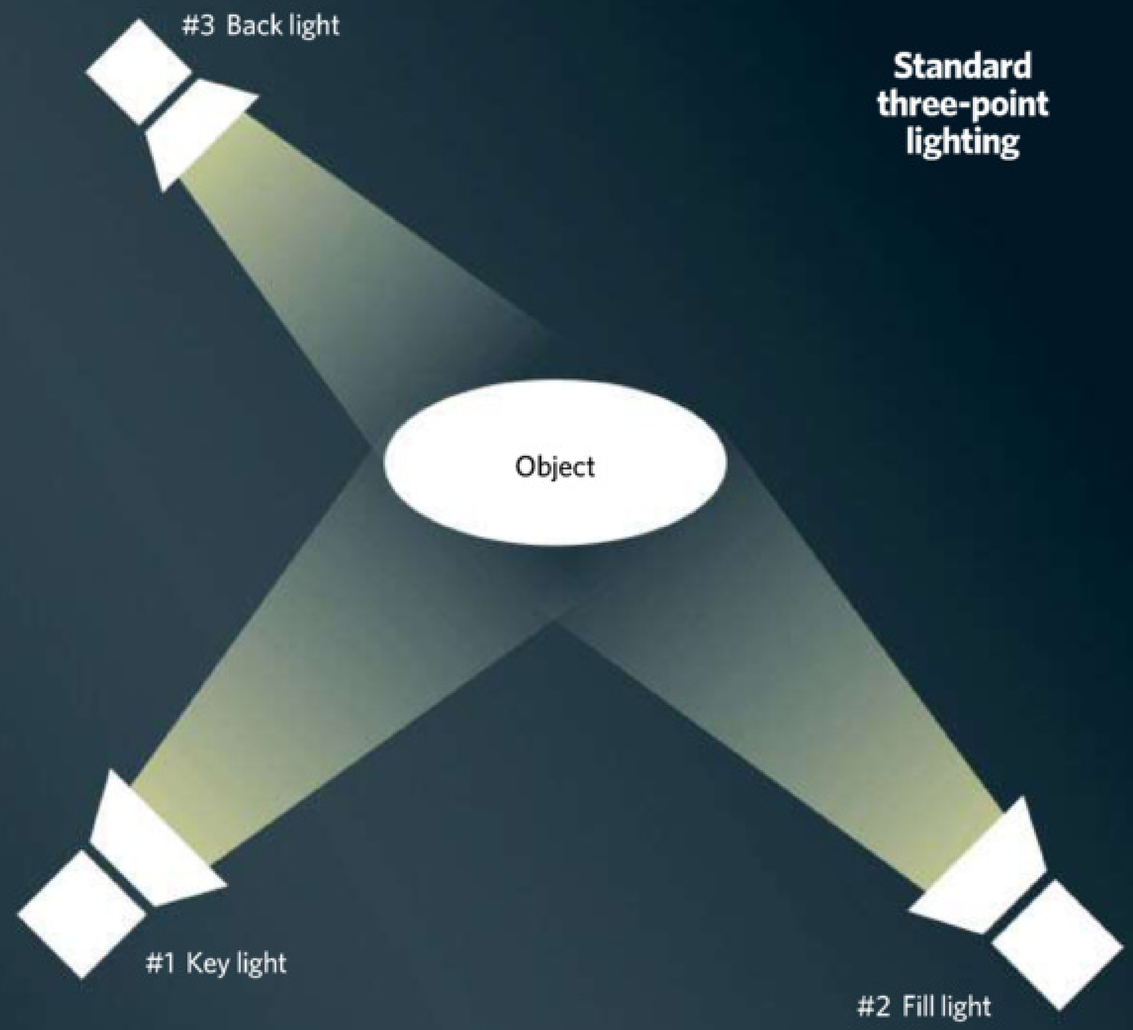
## THREE-POINT LIGHTING

Considered the standard in lighting setups, three-point lighting involves using three (believe it or not) different types of light at different angles in order to balance your image in a natural, realistic way. It's a technique that has been used in everything from portrait photography and cinematography to classic paintings. To create a three-point lighting system for your piece, you will need a back light, key light, and fill light surrounding your character or subject.

**The key light** – which in an outdoor scene would usually be the sun – is normally placed 45 degrees from either side of the camera. This should provide the main illumination used to light the subject, and result in a very distinct contrast between light and shadow.

**The fill light** is used to soften the harsh shadows usually caused by the key light and generally lessen the chiaroscuro effect. It should be less powerful than the key light, and not cause any shadows itself. The fill light is placed 45 degrees from the side of the camera opposite to the key light, so if the key light is on the left, the fill light will be on the right.

**The back light**, which is frequently called the rim light in 3D, will shine on the subject from behind, creating a rim of light around an interesting element in the piece. This helps to separate the subject from the background.



man machine

AUTODESK.
Authorised Training Centre

# Man and Machine Training Academy

## Man and Machine offer an extensive range of Autodesk 2015 training courses

**Man and Machine** specialise in **Autodesk training** for Manufacturers, Engineers, Architects & Product Designers.

All courses are taught with the official Autodesk courseware and includes one month's free post training support.

### Autodesk AutoCAD courses include:

- **AutoCAD** Essentials
- **AutoCAD** Electrical Fundamentals
- **AutoCAD** Advanced
- **AutoCAD** 3D Drawing & Modelling
- **AutoCAD** Mechanical Essentials

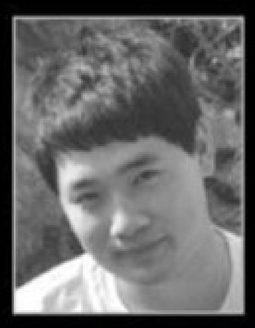
**E:** marketing@manandmachine.co.uk
**W:** www.manandmachine.co.uk **T:** 01844 263 700

Connect with us

# Technique focus

**Incredible 3D artists take us behind their artwork**

**CONCEPTION** I was so keen to create this piece, as I'm very interested in the traditional culture of China. I wanted to depict a story about a landlord who just got married to a young woman. As I was working I made sure to add plenty of fascinating details to the piece in order to make it look more comic. I hope you like it! **Wedding Night,** 2014




## Flynn Lee

**Website** http://blog.sina.com.cn/u/1920414775

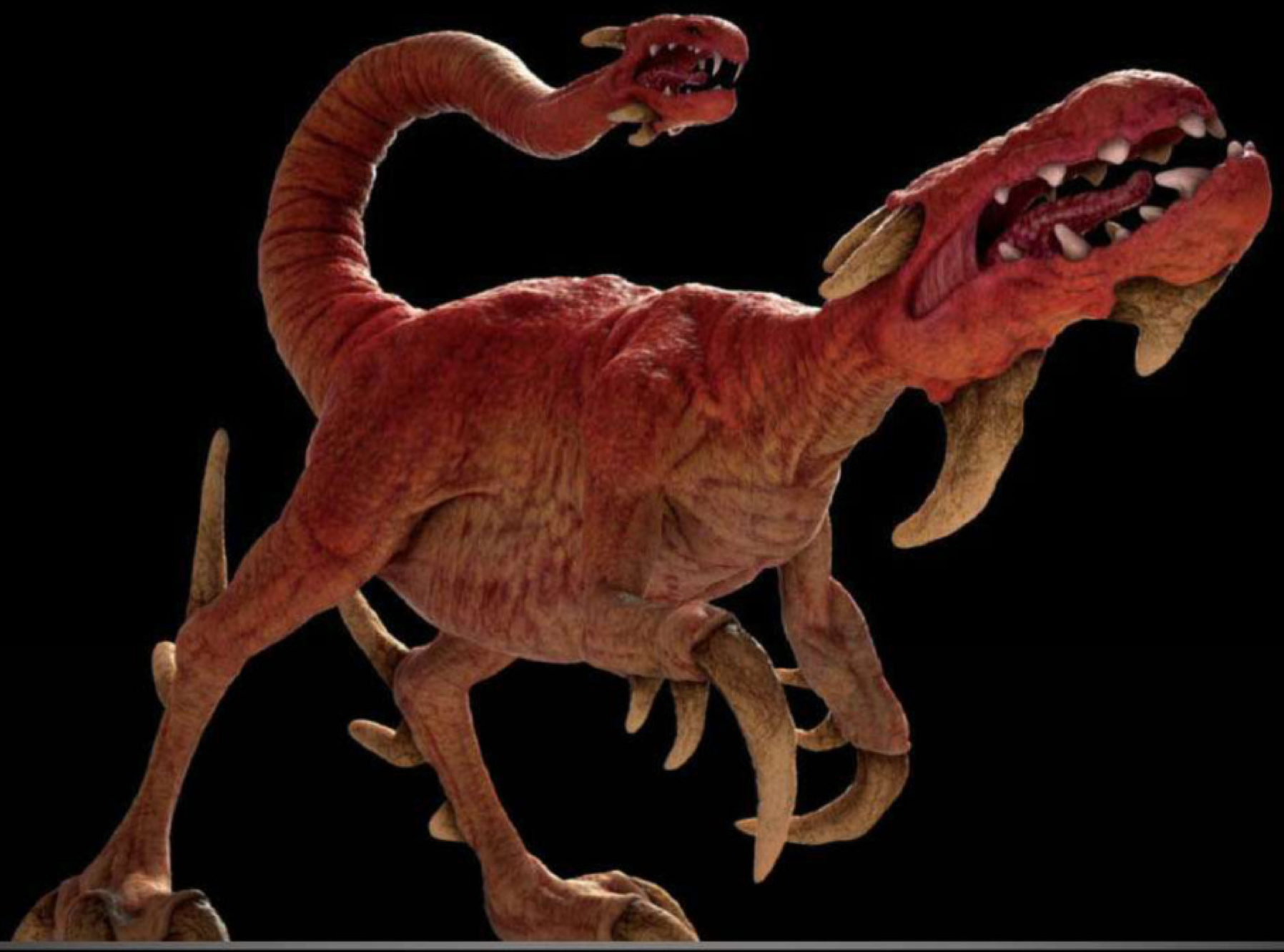
**Country** China

**Software used** Maya, 3ds Max, ZBrush, Mudbox, Photoshop, V-Ray

**Bio** Flynn Lee is a 3D character artist based in Shanghai

# KeyShot® 5

Amazing renderings and animations. In minutes.



## KeyShot 5. Out now.

KeyShot is widely recognized as the fastest rendering software on both Mac OS X and Windows for look dev and pre-viz concepts or creating promo art and production visuals. Fast. Easy. Amazing. This is KeyShot.

Model by Dreamsmith
www.dreamsmith.com

Download at:
keyshot.com/try/

## Download

**Tutorial files:**

- Tutorial screenshots

**filesilo.co.uk/3dartist-76**

## Learn how to

- ☑ Sculpt inorganic surfaces
- ☑ Create realistic details
- ☑ Paint the model

Step by step

Easy-to-follow guides take you from concept to the final render

Artist info

**Nikita Kuzmichev**

3DArtistonline

**Username:** nkuzmichev

**Personal portfolio site**
www.nikita3dart.tumblr.com

**Country** Russia

**Software used**
ZBrush, Photoshop

**Expertise** Nikita specialises in creating characters, from concepts to in-game meshes

# Sculpt a sci-fi soldier

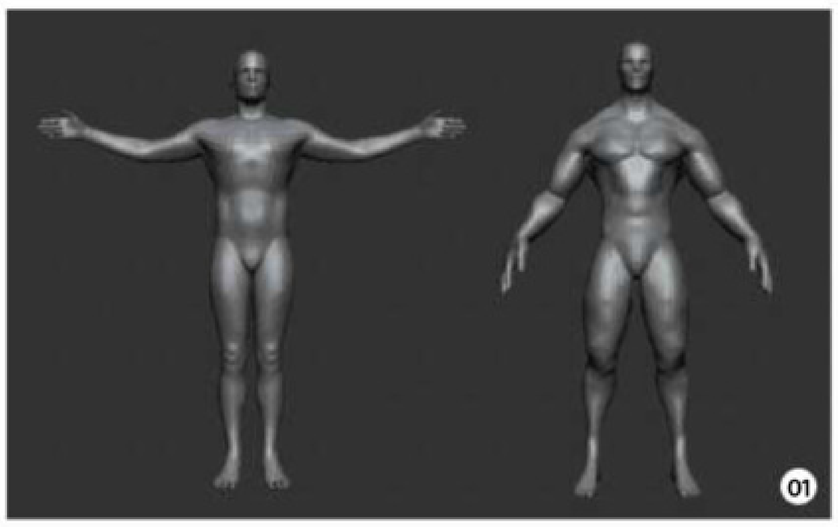
## Sci-fi Soldier 2014

"I wanted to create a character in a science-fiction style, something between a policeman and a sniper"

**Nikita Kuzmichev** is a 3D artist specialising in the development of characters for videogames

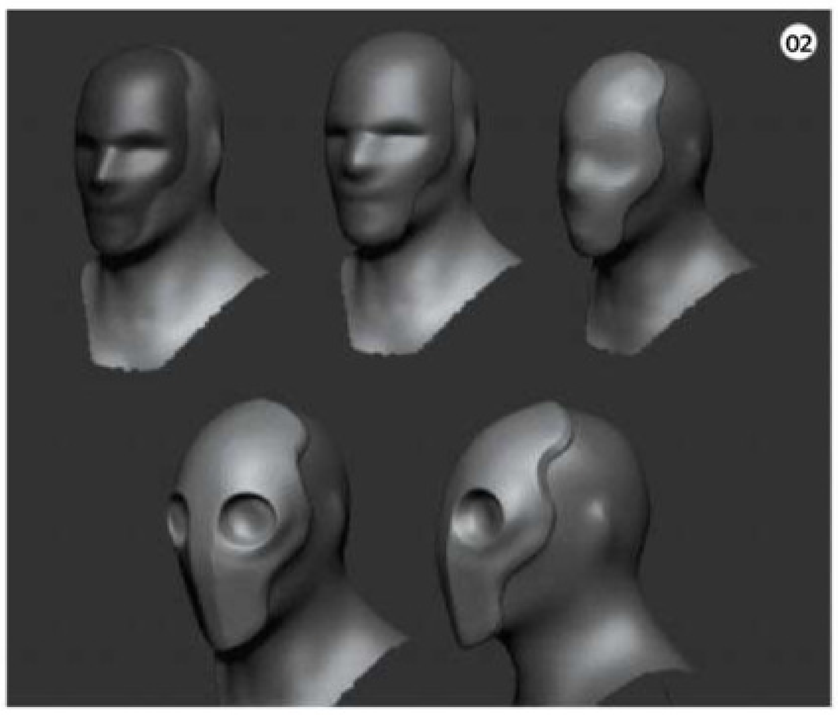
**In the following 17 steps you'll create this soldier model in ZBrush, with post-production work completed in Photoshop.** ZBrush offers us effective and easy-to-use tools for masking and extracting, as well as the all-powerful ZRemesher feature.

Here you'll learn how primitive forms can be transformed into a hard surface by adjusting the Alpha maps and using DynaMesh. We'll also touch on painting and posing, before setting up the rendering process and completing the post work using Photoshop tools.




**01 Block out the main mesh** First it's necessary to make the base of the model. This should be a human-like form, with all the general proportions required for the final character. To make things easier you can use the standard model SuperAverageMan_low. This may need a few changes to its position, so that when you set up in the final pose there will be minimal stretching. This means you won't have to tweak the proportions as much.

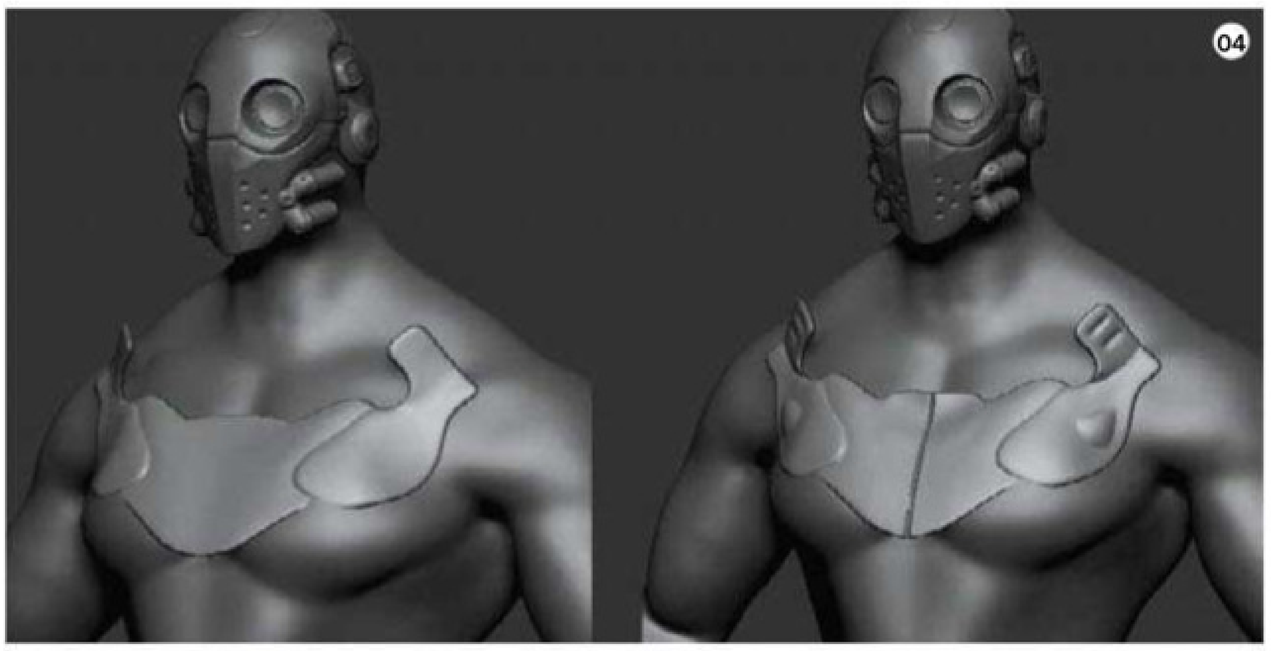
**02 Sculpt the facial mask** Next, mask the front of the head, then use the Extract tool located in the SubTool tab, changing the Thick parameter for the desired thickness. As a result, you'll produce a basic form from which you can sculpt a helmet – remember, it's best to sculpt from a low subdivision level to a high one. In this way, you can better control the shape and avoid unnecessary artefacts. Use ZRemesher, then the Move and Clay Buildup brushes. Once you're satisfied with the form at this subdivision level, add a new one.



### Configure the functions

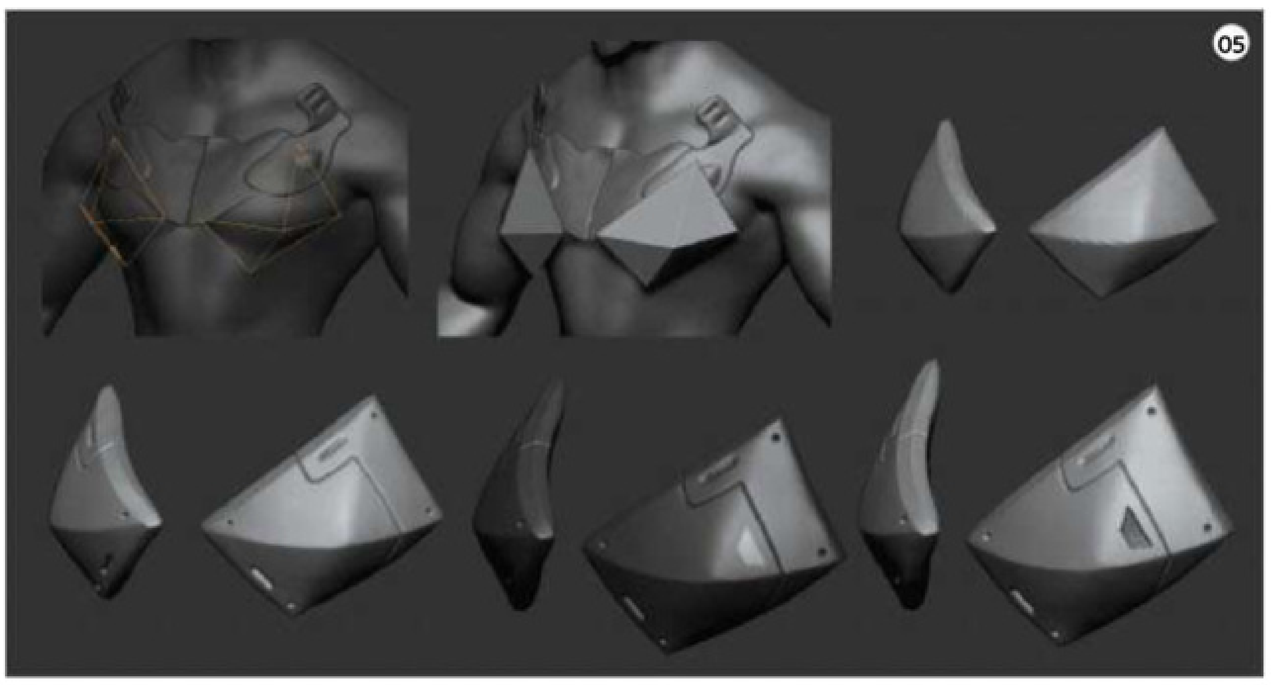
ZBrush provides complete freedom of choice. You can change the specifications and features of each function or brush, or even create your own Alpha in Photoshop. Don't be afraid to experiment. You can search for tools or Alphas on various forums or communities and have a look at Pixologic's Alpha Library at www.pixologic.com.

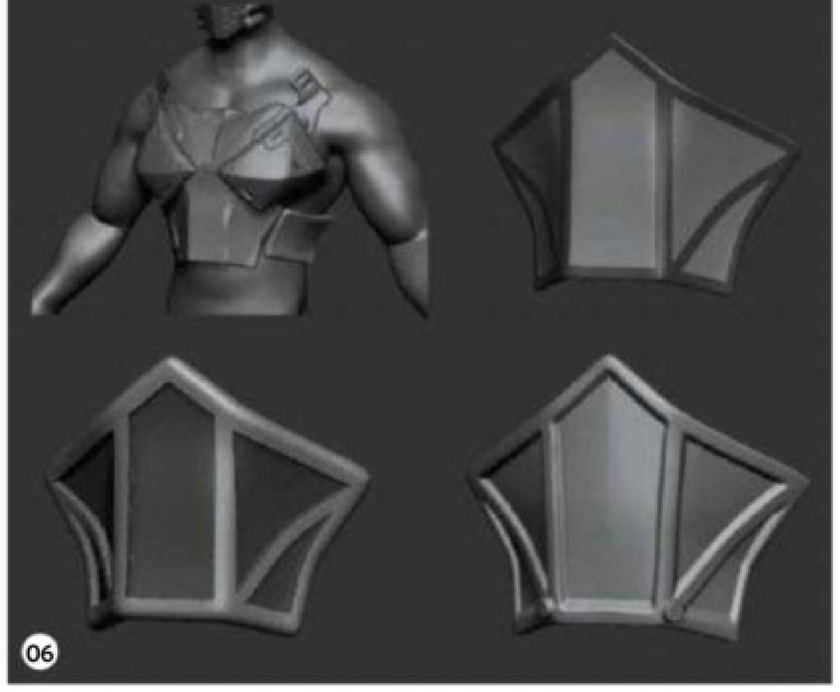
**03 Detail the head** To make a sharp form, pick the hPolish or Trim Dynamic brush. Start detailing the head – you can use Dam_Standard with Lazy Mouse turned on to make a smooth line. In the Stroke tab, select BrushAlpha to get your desired result. For small holes at the mouth, use a Standard brush, change Current Stroke to DragDot and also select your desired Alpha. Some parts can be completed using Radial Symmetry, which can be found in the Transform tab. Further details can be added using the same methods and tools.




**04 Begin work on the armour** Now it's time to work on the breast plate. Start with those elements that are closer to the body using the Mask, Extract and ZRemesher tools. Include details such as bends with a mask, then mask and use the Transpose tool to finish. Make two sharp lines of the mask and use the Layer brush to create hollows.

**05 Build the plates on the chest** In order to start constructing the forms of the body armour, append a ZSphere, select it, turn Edit Topology on in the Topology tab and sew the mesh. Next, turn Make Adaptive Skin on and start sculpting – the lattice on the side can be made using an Alpha, just as with the holes at the mouth, but the Alpha should look like black-and-white tiling lines.



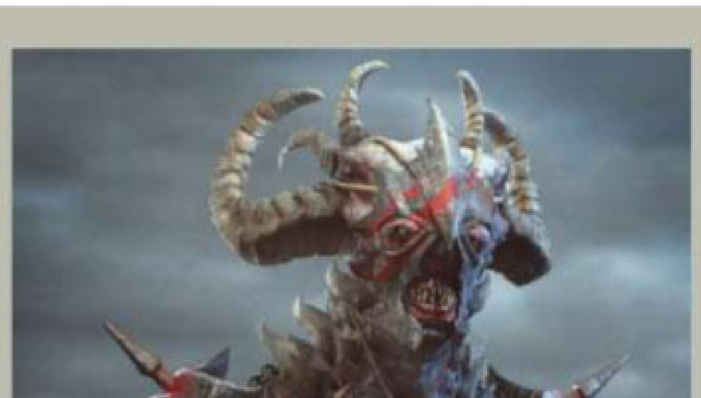

**06 Add a plate to the torso** Now sew the mesh by points, or by using a Topology brush – in which case you can draw the polygonal mesh. To extrude a form, as shown on the accompanying screenshot, first mask the area for extrusion, invert the mask and use Inflate in Deformation. Now treat the surface using ClayPolish or Polish Crisp Edges.

**07 Finish sculpting assets** Fashion the other parts of armour using all the same steps covered previously, making sure that they all fit into one whole. Use a mask, customise the Alpha brush and try using a Clip. The next stage is to insert a mesh by searching and trying new brushes or tools. ZBrush includes a huge number of opportunities to save time and some items can be cloned, but try not to overdo it.

## Artist showcase

### Nikita Kuzmichev

My name is Nikita. I'm 19 years old and I live in St Petersburg in Russia, working as a 3D artist at Sperasoft studios, a team of professional artists, developers and engineers that work in the videogames industry. In my spare time I am fond of Thai boxing.



***Demon head*** **ZBrush, V-Ray (2014)**
I created this just for practice, as I wanted to make something sinister.

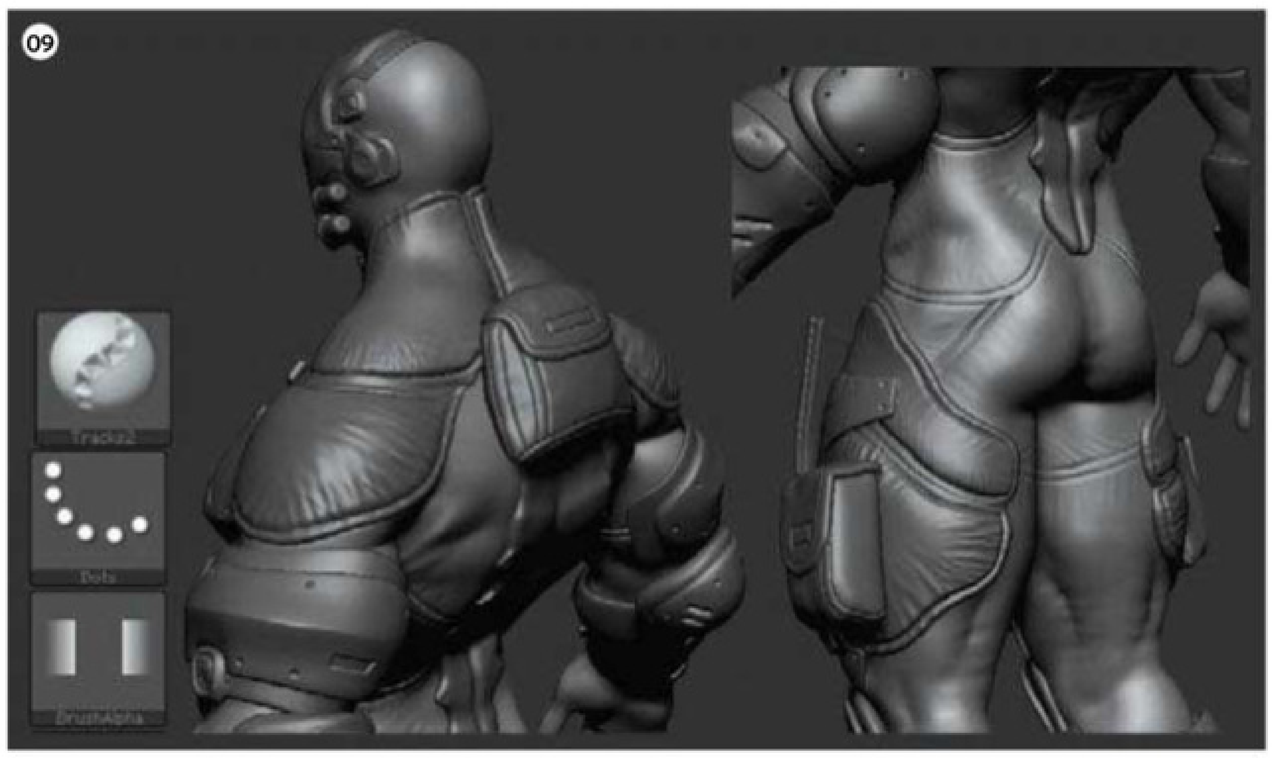
***Portrait of an orc*** **ZBrush (2014)**
I needed some kind of avatar for forums, so decided to make this orc.

**08 Add leg armour** To make the lower-body armour, you can copy the foot from the block-out mesh and sculpt it. For the soles, select an InsertHCube brush, make a set of cubes and tweak them so that the tops of the cubes are entered into the boot, then turn on DynaMesh.

**09 Create clothes** Double seams can be made using a Tracks brush with a special Alpha made in Photoshop. You can find these brushes in the designated area in ZBrush. To find them quickly, click on the LightBox section. This folder is highly useful, as there are many more tools found here than in Quick Pick. Also try forming small folds using a Rake brush.

**10 Add belts** Belts and a variety of wires can be modelled with an IMM Curve brush. In the Brush menu find Modifiers, where you can choose one of the standard meshes to insert or create your own. If you want to make your own, add a new SubTool, open the Quick Pick and then click on Create InsertMesh. To impose this SubTool on the curve, turn on Curve Mode in the Stroke menu.

**11 Make a noise effect** You can now easily bring some noise to the fabric to make it look more realistic. This can be done by pre-configuring the UV: Go to ZPlugin>UV Master>Unwrap, then add noise via the Surface tab. You can use the standard types of noise in the NoisePlug, or assign your own Alpha. A considerable range of Alpha maps and fabrics can be found online at **www.pixologic.com**.




## Don't be afraid to re-try

If you don't like how certain details have turned out, just start from the beginning. Before making seams, grooves or a chamfer, you can apply the Morph Target. Click on StoreMT, then if you make any changes on the surface, you can return it to its initial state.

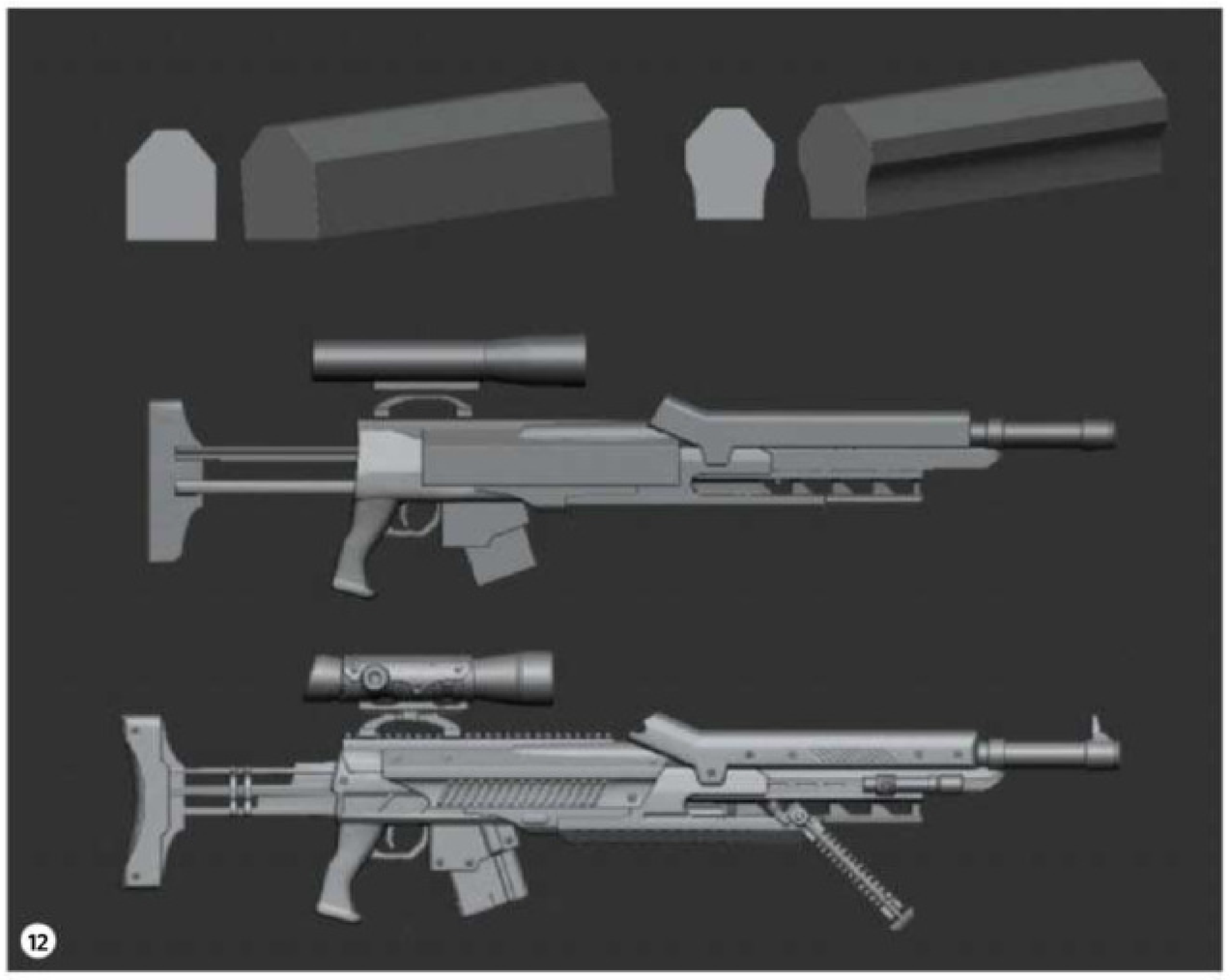
***Boneshredder*** **ZBrush (2013)**
This is one of my first works, done while I was a student – pictured is the model before post work.

**12 Build a weapon** Before starting work on the weapon, you need to collect the basic form of the Primitives to define its proportions – for some elements you can use ShadowBox. Next, add some details using the techniques as described before: by masking, adjusting Alphas, using Radial Symmetry and so on. Also try to apply the Clip tools, such as the ClipCurve shown on the accompanying image.

**13 Paint the model** When you're satisfied with the model, it's time to give it some colour. In ZBrush you'll find a useful feature called PolyPaint, with which you can use any brushes if you switch the brush mode Zadd to RGB. You can also use noise for colour – in the Noise settings, just set the value to ColorBlend. To set labels, use a Standard brush with the texture of the inscription, using DragRect as the current stroke and a special Alpha where the black background and white text of the inscription is.

## Work with textures

Spotlight is a handy feature to work with textures in ZBrush. In the Texture menu, import any image then turn Add To Spotlight on. With this you can easily apply a texture to the surface with brushes. If you use a brush in RGB mode, then the colour will be applied from the image, whereas if the brush is in Zadd mode, the image will work as an Alpha. It's very convenient for overlaying different scratches, general roughness, or other characteristics of materials.


12

**14 Pose the model** To put the character in a suitable pose, all of the SubTools need to work together. Transpose Master in the ZPlugin menu is perfect for this task. Click on TPoseMesh and rotate all parts of the body while masking, then make sure the position is realistic and don't damage the details. When the position is ready, click on Tpose to SubT.

## Concept

The main inspiration for this character was a member of a special forces unit, something like a sniper. Imagining what a futuristic special forces soldier might look like helped direct the model.

14

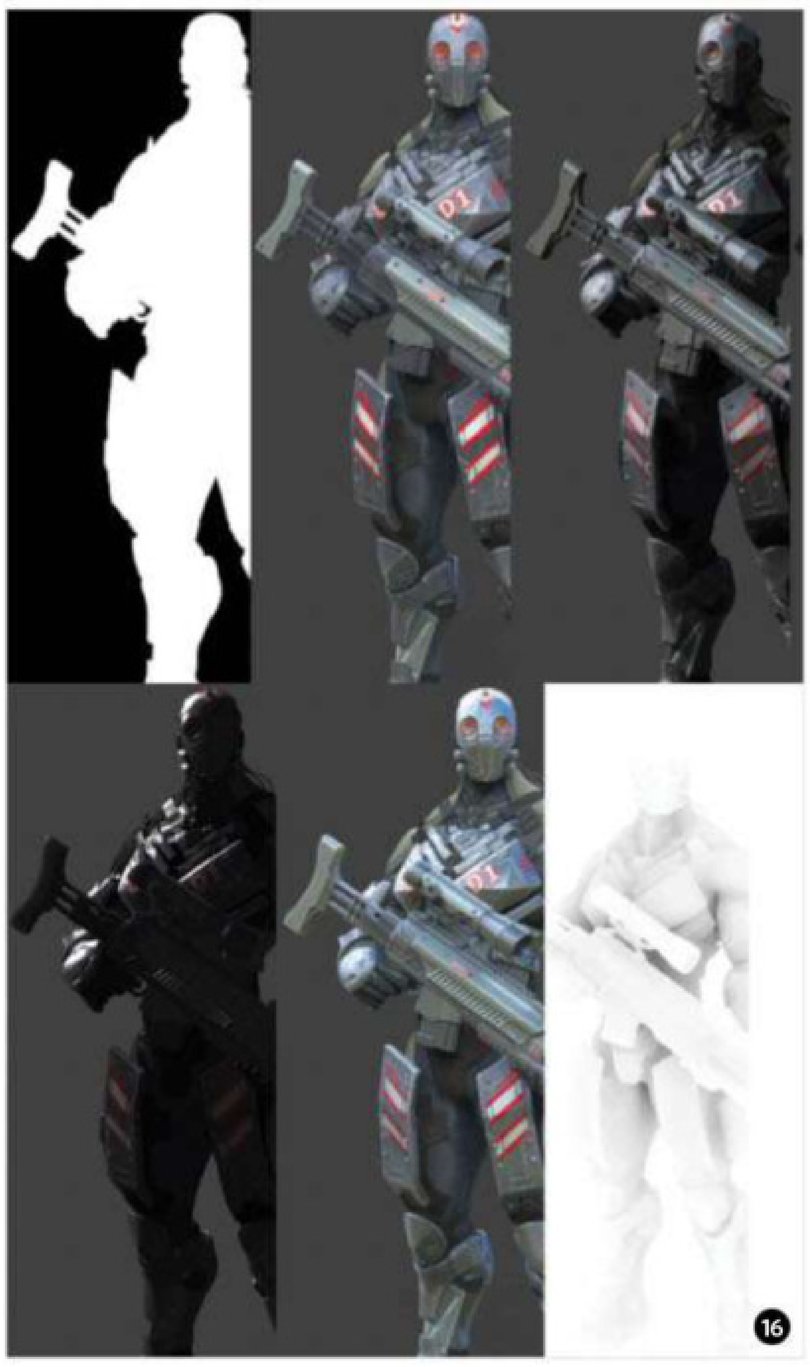
**15 Set the materials** Start tweaking the material settings by going to the Material tab under Modifiers. Add Specular and Reflectivity to any metal parts, but reduce the values of the tissue element parameters to a minimum.

**16 Begin rendering** The final image will combine render passes, such as a Mask, Lights, Reflection and Ambient Occlusion. For basic lighting and reflection, you can use Environment. In the Light menu, find Background, then select the Environment Texture and click on LightCaps. For a Reflection pass, turn on Reflect. In the LightCap you can adjust the light sources. For Ambient Occlusion, find the Render Properties and turn on AOcclusion. When done, save all the render passes from BPR RenderPass in the Render menu.

**17 Make final adjustments** When all the render passes are ready, it's time to compose them with Photoshop. Add up all the passes in the different layers with various blending modes, configure their opacity and use adjustments, such as Exposure, Curves and Vibrance. Add a mask made in ZBrush as a channel and adjust the background. Experiment, create new layers with different filters and keep changing the blending modes until you're happy with the result.

## The finishing touches

Carefully look at the result. Don't be afraid to change or modify something if you don't like it, no matter which stage you're working at. Try new poses and angles, change the value of perspectives, alter the location of light sources or the background image and play around with the features in Photoshop. Don't be put off trying new things.



• **DID YOU KNOW?** • All tutorial files can be downloaded from: **filesilo.co.uk/3dartist-76**

Pixologic™

ZBRUSH®

IDEAS BORN IN CLAY

wwwPixologic.com

www.ZBrushCentral.com

Image Courtesy of Gregory Callahan · www.gcallahan.com

# Technique focus

**Incredible 3D artists take us behind their artwork**

**LIGHTING & TEXTURING** I was concerned about getting the snails' skin right. Using Blender's 3D texture paint mode, I painted the skin on where appropriate using textures made in Photoshop. These textures were then used as the basis for creating the bump and specular maps. For lighting I used an HDR background image and a very low intensity 'sun' light. **Snail Love,** 2014

Aaron Wiesinger

3DArtistonline

**Username:** awiesinger

**Website**
www.AaronWiesinger.com

**Country** South Korea

**Software used** Blender/Cycles, Photoshop

Step by step

Easy-to-follow guides take you from concept to the final render

Artist info

**Tom Parker**

3DArtistonline

**Username:** Crazyfool

**Personal portfolio site** http://tomparkersartdump.wordpress.com/gallery

**Country** United Kingdom

**Software used** ZBrush, Maya, Xnormals, Photoshop, Toolbag 2

**Expertise** Tom specialises in character art for games, from concept to the final asset

# Create real-time hair in ZBrush

## Hairstyle Tutorial 2014

> This image was created to demonstrate an art-centric workflow for creating real-time hair for games

**Tom Parker** is a freelance character artist, working with clients all around the world in the games industry

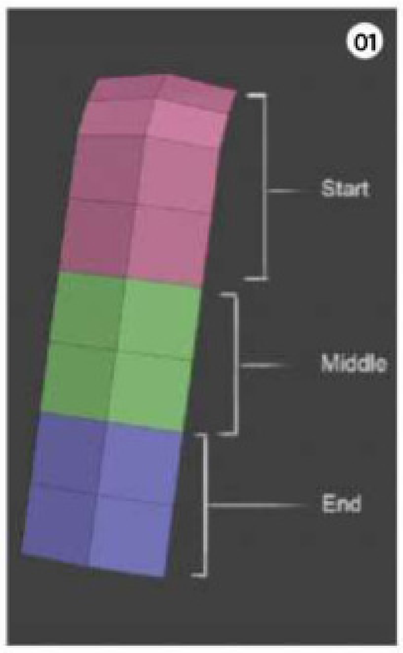
**Making believable real-time hair for games is often a very technical task, usually requiring the use of specialist in-house hair solutions or lots of fiddling with curves.** However, it doesn't have to be this way. Through clever use of ZBrush, we can streamline the process and create a hairstyle from scratch in a few hours.

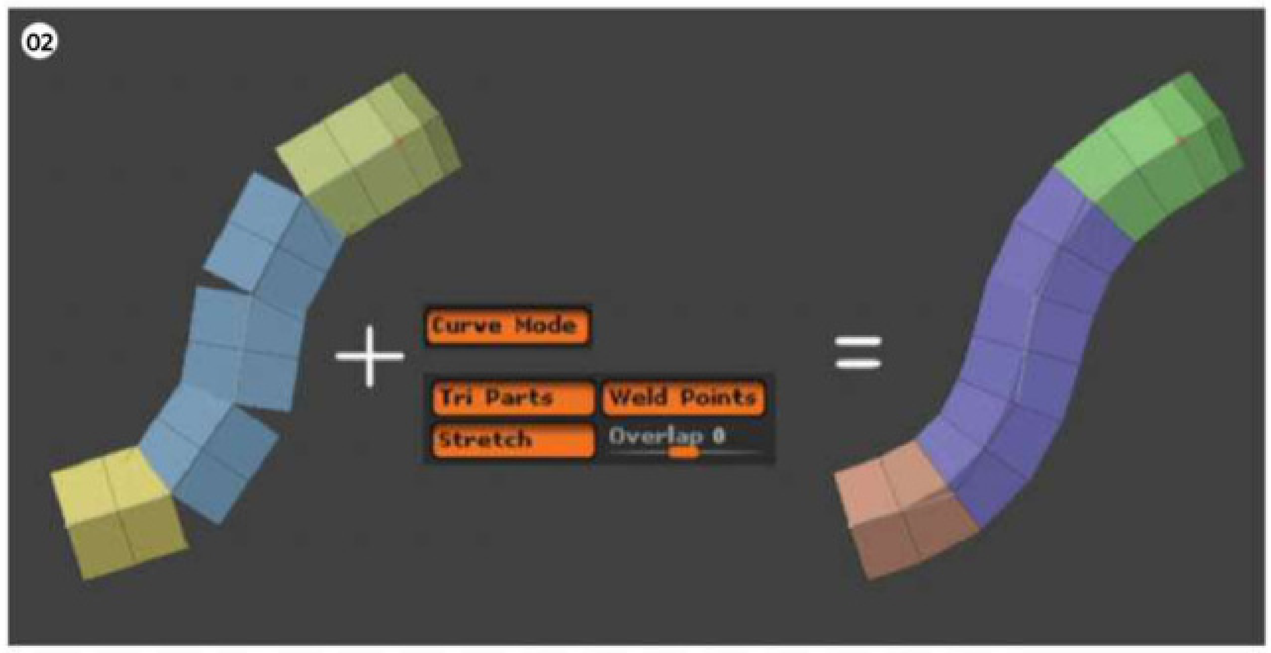
Here you'll build medium- to long-length hairstyles in line with the latest videogame techniques and specifications.

The idea behind this workflow is to keep the process as artistic as possible, so we'll be working in ZBrush often, using InsertMultiMesh brushes for laying down our Alpha strips and also in creating believable hair that can be baked down for the texturing process.

We'll finish the tutorial in Marmoset Toolbag 2, which is a real-time PBR renderer. There are also a few tricks to learn to help make hair more believable within Toolbag 2.

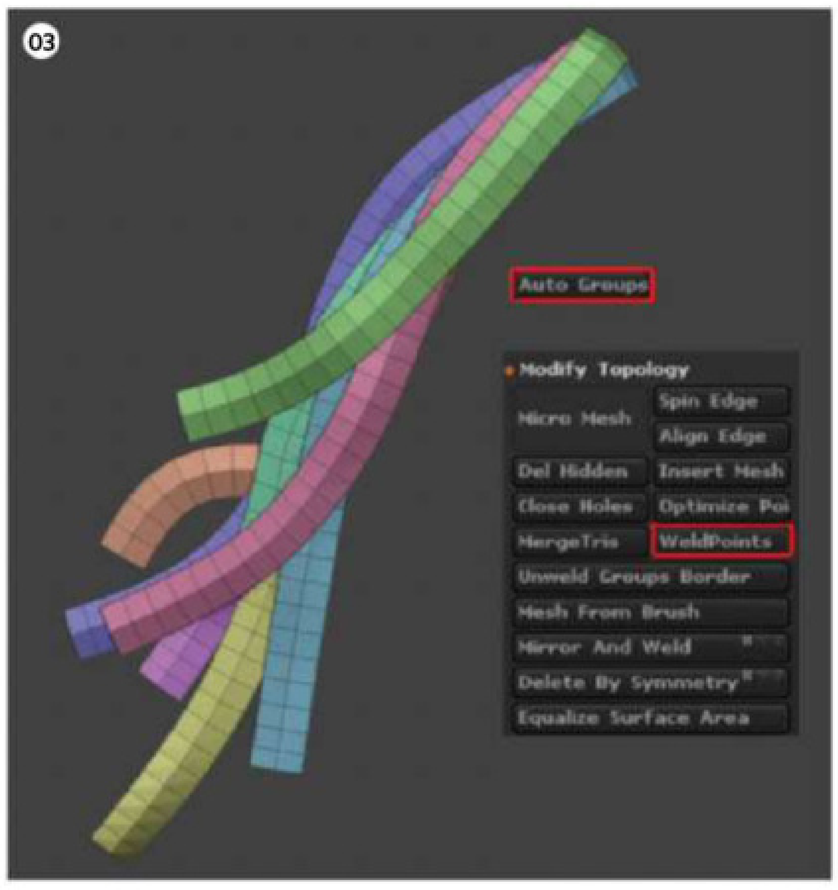
**01 Prepare your IMM brush** This is going to be the basis of our Alpha cards, so is very important to get right early on. Luckily, it's very simple. In your 3D app of choice all you need to do is create a start, a middle, and an end. I prefer to add a slight curve to the top, so it replicates the natural curve from the root. These meshes must be flush with one another and assigned their own PolyGroups in ZBrush.




**02 Set up the IMM brush** In ZBrush we need to duplicate the SubTool for the brush to work, or you can also add new meshes that might help later on, such as a single strip brush instead. With the mesh snapped into place in the viewport, you can hit Brushes>Create InsertMesh. With the mesh locked in, we just need to play with some settings. Start by turning on Curve Mode in the Stroke setting, then clicking on Brush>Modifiers>Stretch/Weld Points. You may need to increase the Curve Res as well. This is so that the meshes weld together during each stroke.

**03 Quickly test the brush** Now we should be able to test the brush and make sure it's working correctly before saving it for use later. Make sure the depth is correct so that you can layer the strips on top of one another and that the points are welding nicely. To do this, lay a few strips on a plane and then, when you're happy, go to Tool>Geometry>Modify-Topology>Weld-Points. Then when you Autogroup, every hair strip should be in its own PolyGroup. This means that the brush is working correctly.




### Keep things flexible

Throughout the process it's important to keep things as flexible as possible. Try not to get too precious over your hair strips, and if it needs reworking or starting over, then it's not a problem. With hair you will have to do a lot of tweaking to the meshes throughout the process to make sure there are no holes, intersecting pieces and so on. Never be afraid to return to previous steps if you feel you need to – it's all a part of the process!

## Download

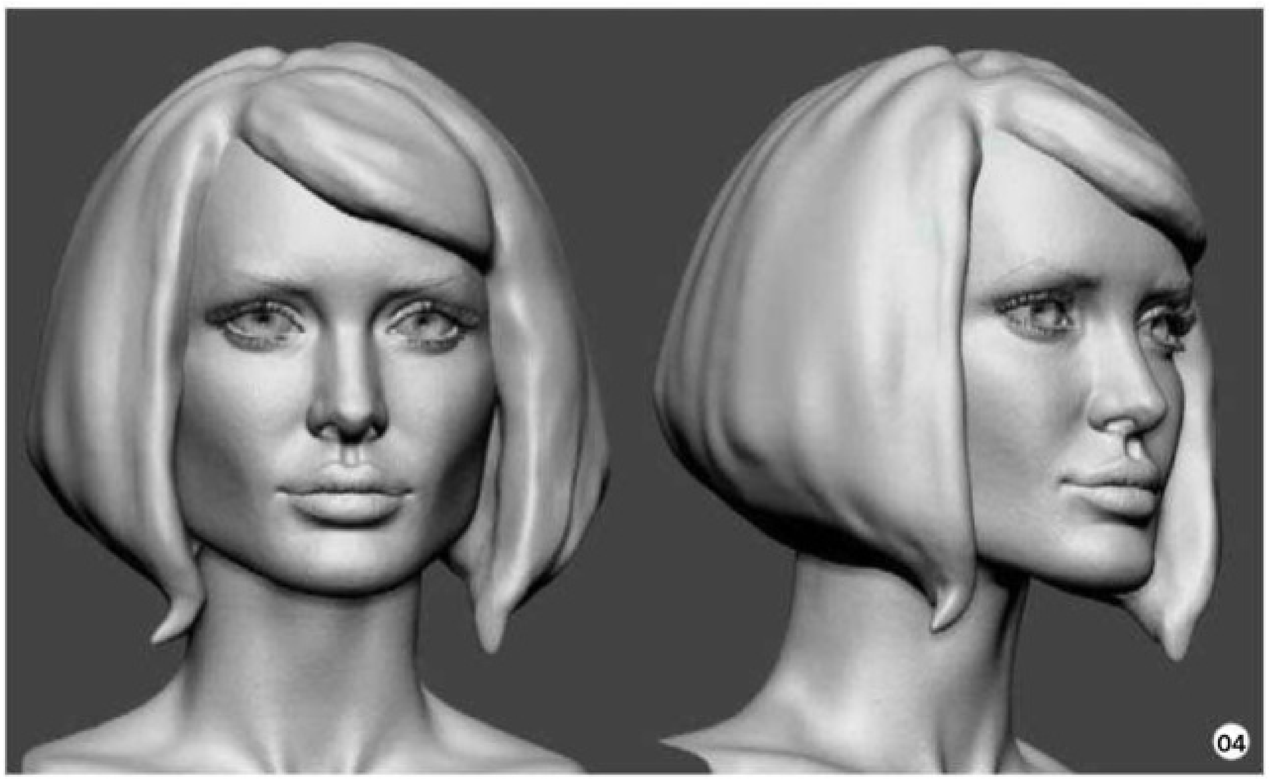
**Tutorial files:**

- Tutorial screenshots

**filesilo.co.uk/3dartist-76**

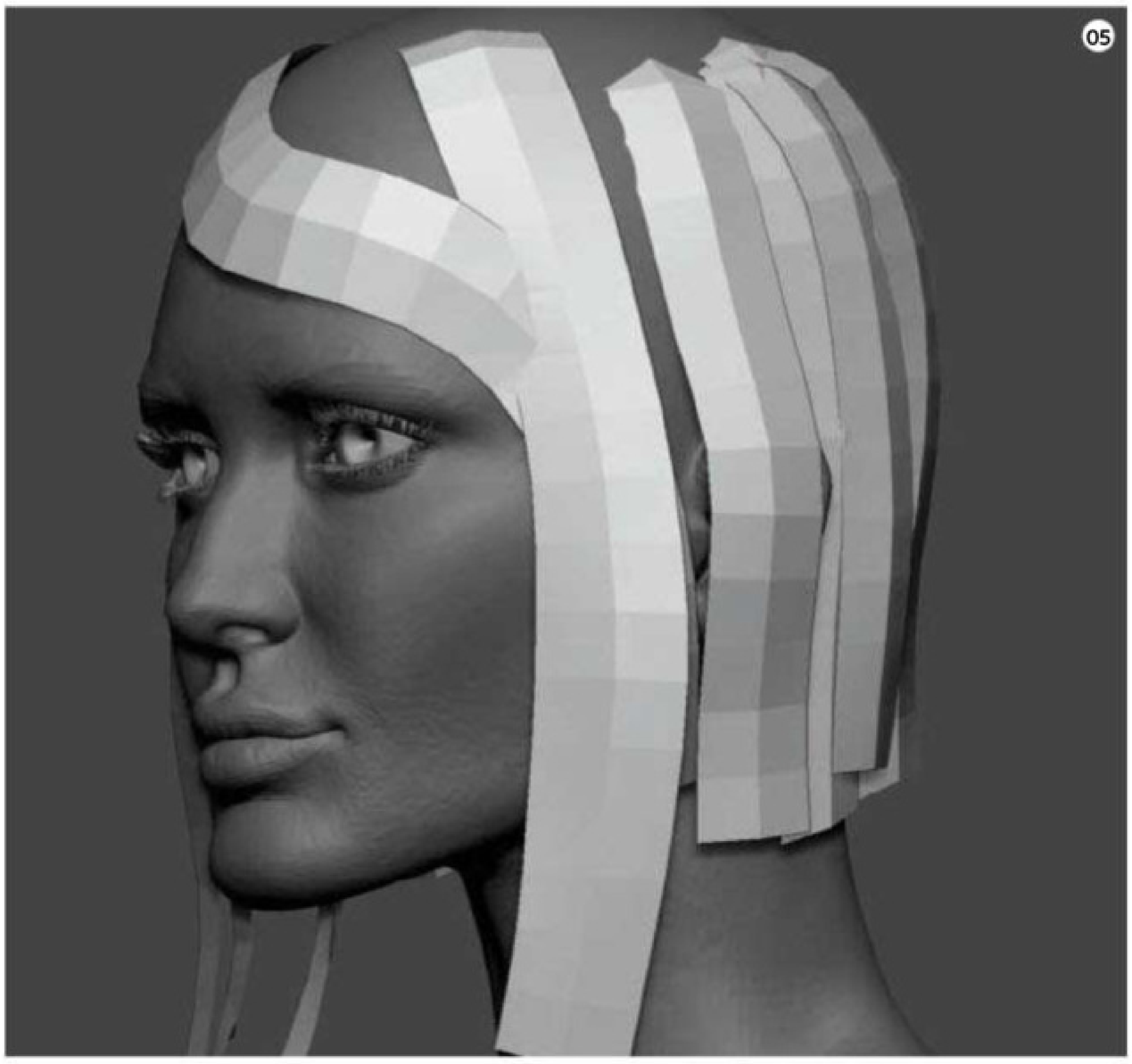
## Learn how to

- Render realistic hair in Toolbag 2
- Create IMM brushes for Alpha strips
- Quickly and efficiently UV Alpha strips
- Use ZBrush to create quality hair textures
- Set up PBR shaders for realistic hair




**04 Concept sculpt** Once you're happy with the head sculpt, start by creating a DynaMesh hairstyle. This is a very important step as it will determine the look of our character and also help us decide on how we will go about laying out the hair strips. This block-in mesh is only going to be used as a guide when laying out our Alpha strips, so we don't need to be too detailed and can concentrate mainly on the style and look of the hair.

**05 Begin to lay hair strips** With the concept sculpt done we can start laying down our base for the hair strips. For this I prefer to duplicate the head sculpt and drop it down to a low subdivision level before deleting all subdivisions – make sure this is a duplicate so you don't lose your head sculpt. Start by laying down the underlying hair and working your way up. When editing the hair, use a large brush size over the curve (Blue reticule) so it creates a smooth transition. Always remember you can use the Move brush if needed.



**06 Finish the hair in ZBrush** By working our way around the model and trying to close as many gaps as possible, we can start to finish up this stage. Make sure you weld points and Autogroup like before for easier editing with the Move brush. If you set this to Topological, you can easily isolate single strips. Keep checking on your concept sculpt throughout to make sure you're sticking close to it. Once you're happy with the hair, you can start preparing it for UVs.

## Artist showcase

### Tom Parker

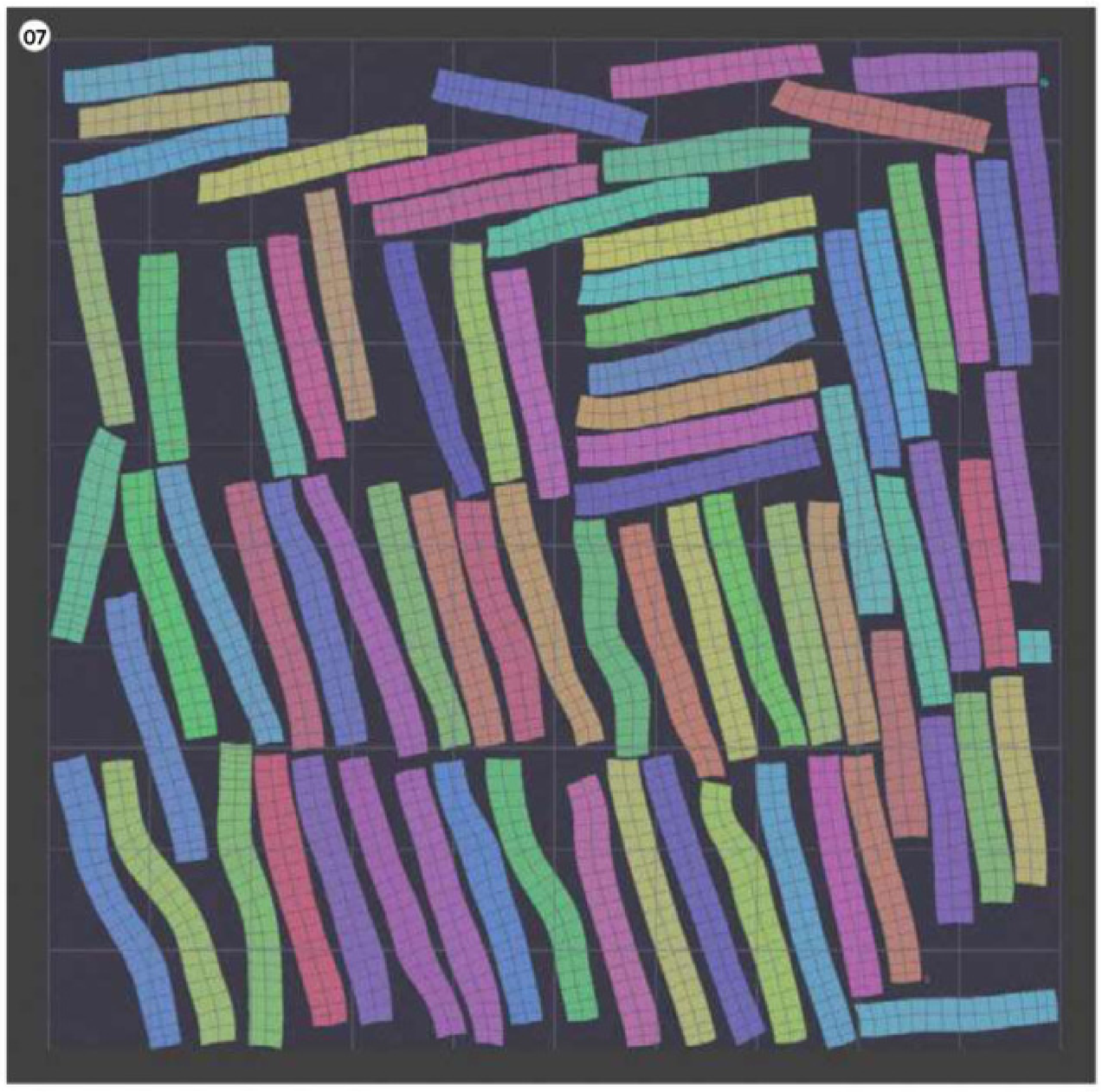
I am a freelance character artist, specialising in a range of real-time, next-generation character art. With over six years of experience in the industry, I have worked on over 15 titles for some of the biggest companies around. Some of my other skills include high-quality cloth sculpting, hard-surface modelling and realistic texture work.

***Space Admiral*** **ZBrush, Maya, Photoshop, Xnormals, Toolbag 2 (2014)**
A personal research and development project.

***Anatomy Study*** **ZBrush (2013)**
Based on the boxer Carl Froch – I wanted to brush up on my anatomy skills. This was all created within ZBrush.

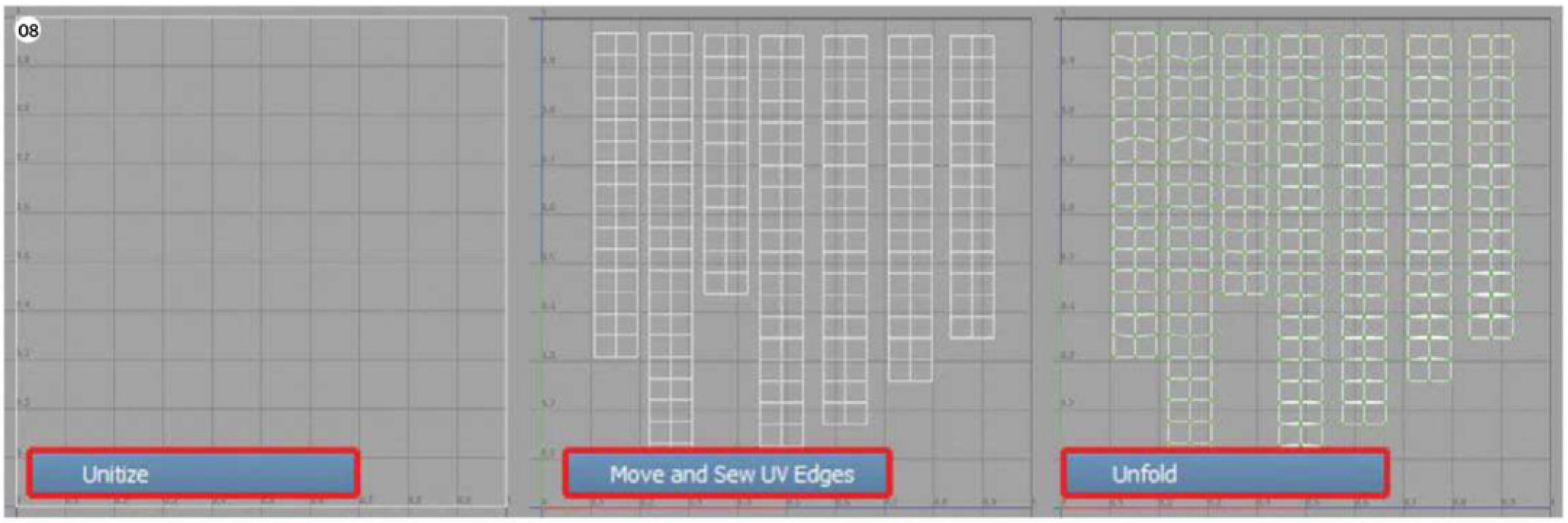
**07 Prepare the hair** The next step is to separate out the proxy head and get the model ready for UVs. Weld the points, Autogroup again, then hide the head and split. Now you should only be left with the hair, so you can start looking for errors. Run a quick UV Master on it to double-check all the points are welded. This should show quite clearly what needs fixing in your 3D application. In the screenshot you can see that a square piece hasn't welded.

**08 Start UVing** You can fix any errors in Maya and then continue to UV the hair. Combine all the hair strips and then select Polygons>Unitize in the UV Texture Editor. This will UV each polygon to 0-1 Space. Next, select the model and hit Merge and Sew. This merges all the strips together, so we can pull the Islands out. The last step is to make sure all the UVs are running in the same direction and then use Polygons>Unfold to minimise any UV stretching – you may want to pin the borders as you do this.



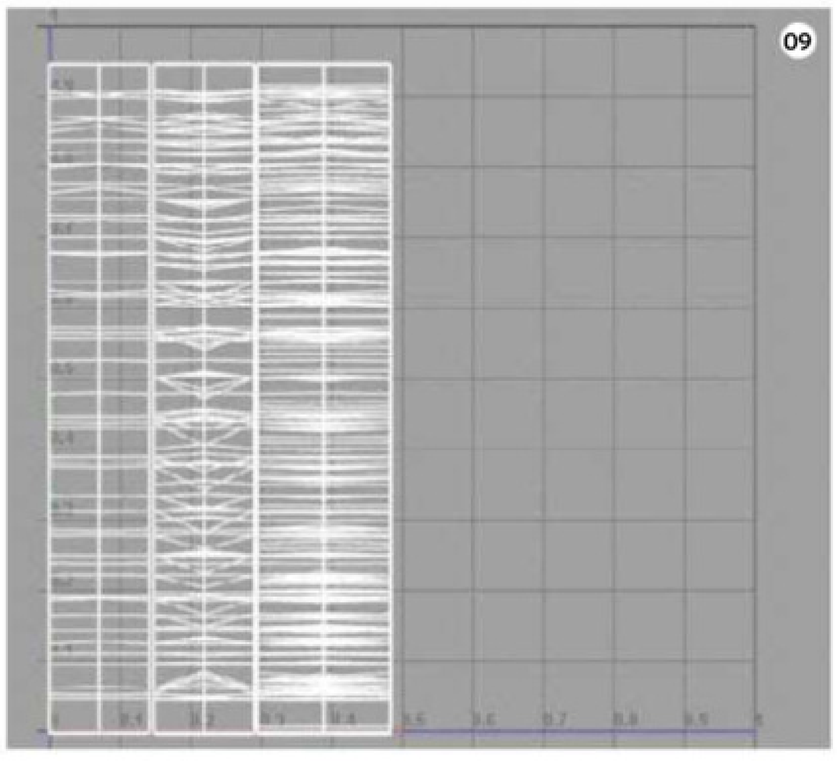

## Texturing hair for games

It's important to find a workflow that works for you when creating hair textures. There are pros and cons to all techniques, but finding the right one for you is essential. We can paint them in Photoshop, manipulate photos, create hair in a 3D app, or even use FiberMesh within ZBrush. In this tutorial I try out a new technique using IMM brushes for a more artistically controlled texturing process. This provides a lot more control and faster results.



***Maleficent Fan Art*** **ZBrush, Maya (2014)**
After seeing the movie I had to sculpt Maleficent. I used this project to learn about realistic sculpting within ZBrush.

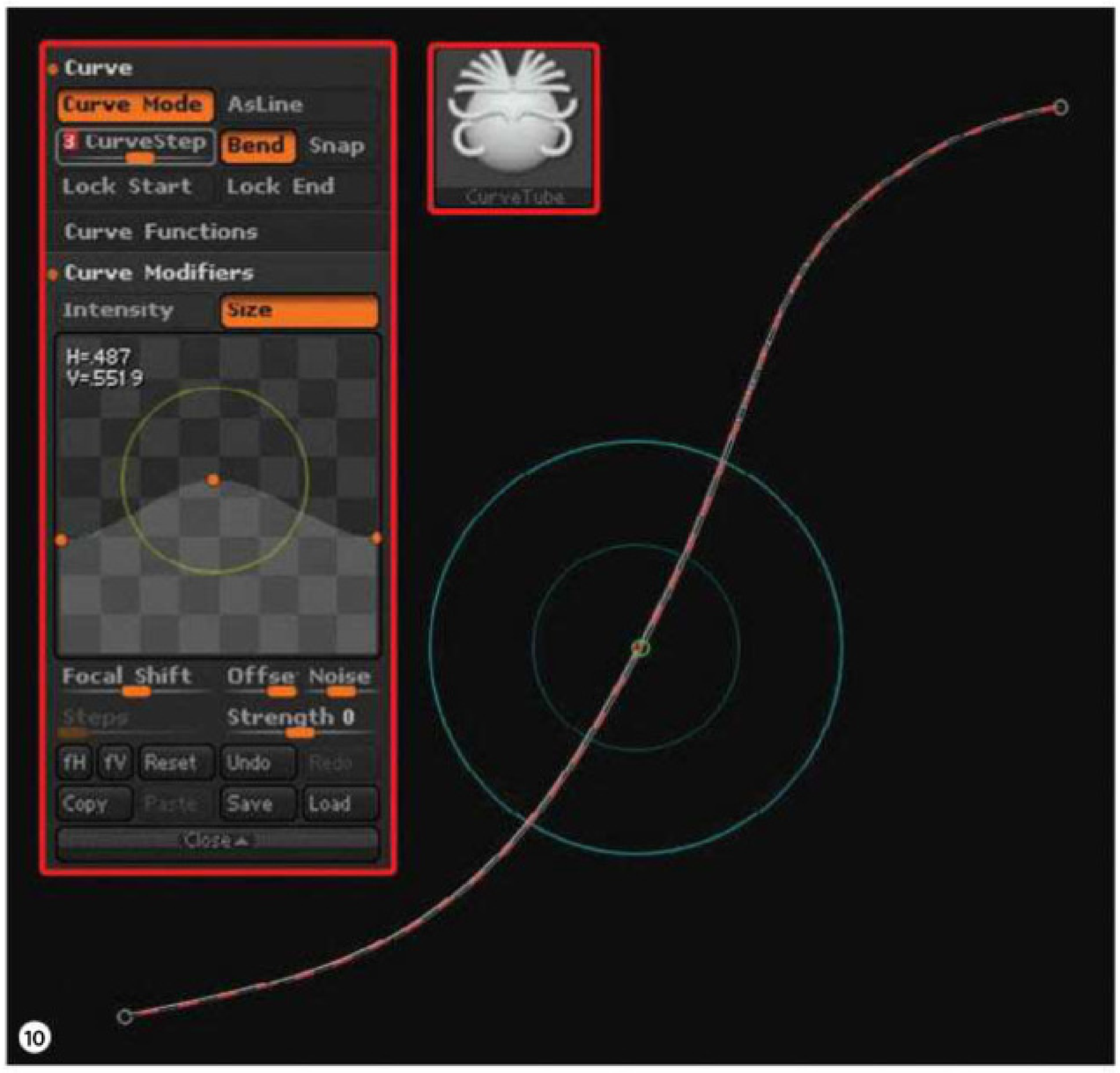
**09 Lay out your UVs** As mentioned earlier, it's important to have your UVs running in the same direction to drive the anisotropic direction in Marmoset Toolbag 2. This requires your UVs to run top to bottom, left to right, or vice versa. Now we need to decide on how many Islands we want and to scale our UVs into place ready for texturing. Once the textures are done, go back to the model and make tweaks, getting an idea of the Islands for texturing.

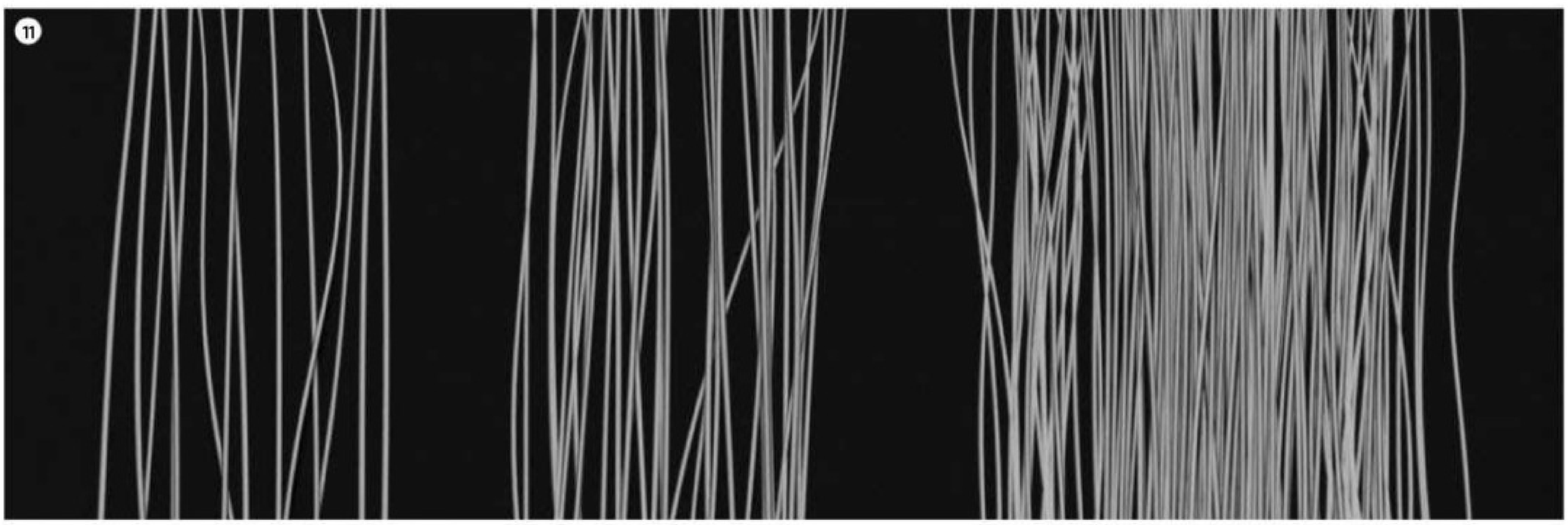


**10 Build the textures** In ZBrush we can try a new and artistic approach to creating hair. Now that we know what Islands we want, we can start laying out our textures within ZBrush. Start with a plane, and then using the CurveTube brush we can actually draw out the hair strands one by one. Before we do this, however, we want to increase the CurveSteps in the Stroke menu so each strand is more optimised, then we can play with the Size to add a bit of shape. Make sure to work from reference also.

**11 Lay down the hair** Now that the brush is set up we can start creating our strokes. I've decided to use three Islands on this hairstyle – one will be full and thick for the larger backing strips and then a medium and sparse Island for detailing. When laying out the hair, it's important to think of your hairstyle and what you're trying to achieve. For most styles you need to keep the strokes relatively straight and very thin. Make sure to work three-dimensionally by pulling some strands forward – this will help when baking to add depth.

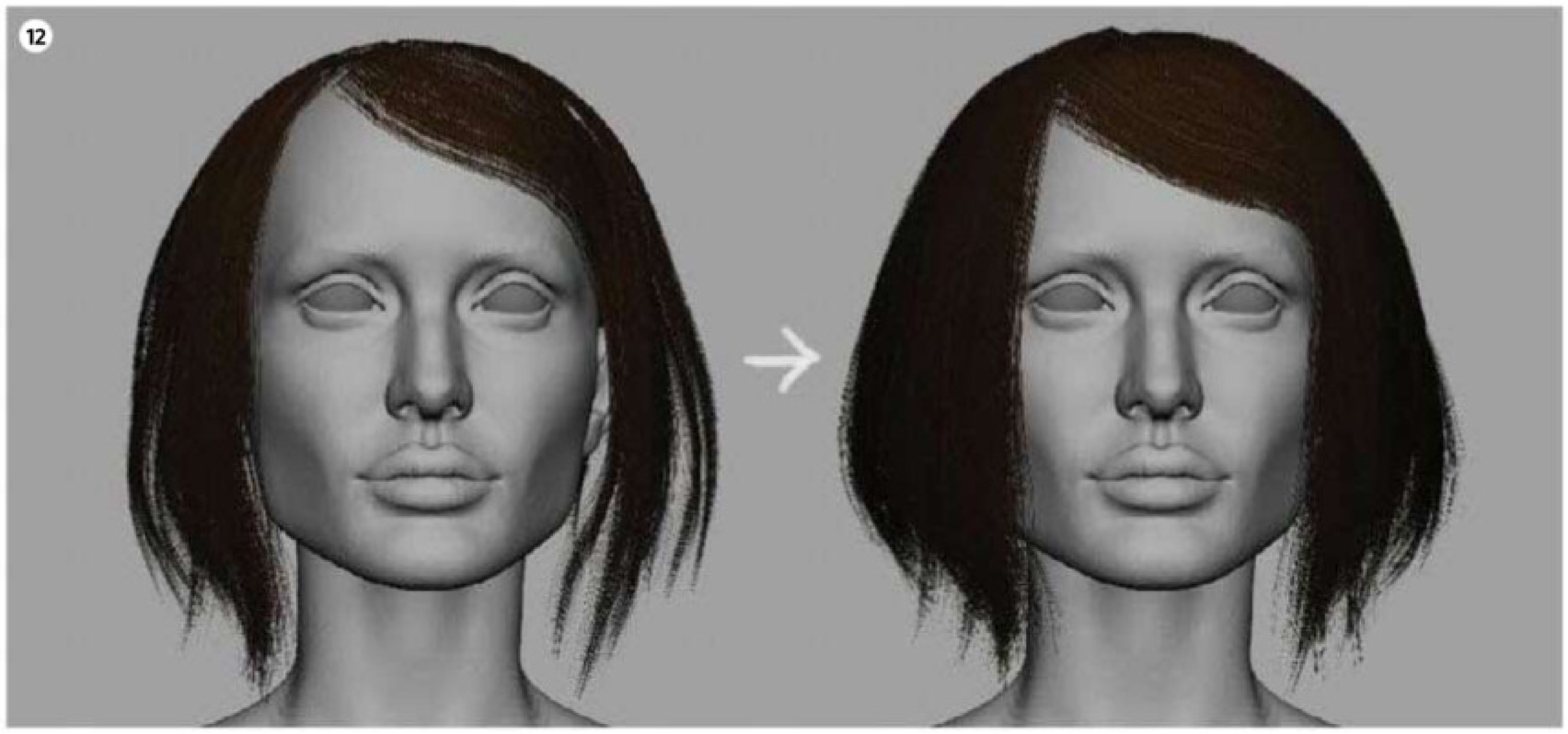
**12 Bake the maps** With everything ready we can start baking out our textures in Xnormals. I polypaint the hair white against a black background to get the Alpha information. Next bake a Normal and an Ambient Occlusion map, which can be tweaked to create Alphas to speed up the texturing process. Now you can start creating your textures. If you want you can also polypaint the hair for your Diffuse / Albedo map, although I prefer to do this all in Photoshop.




## Use reference constantly

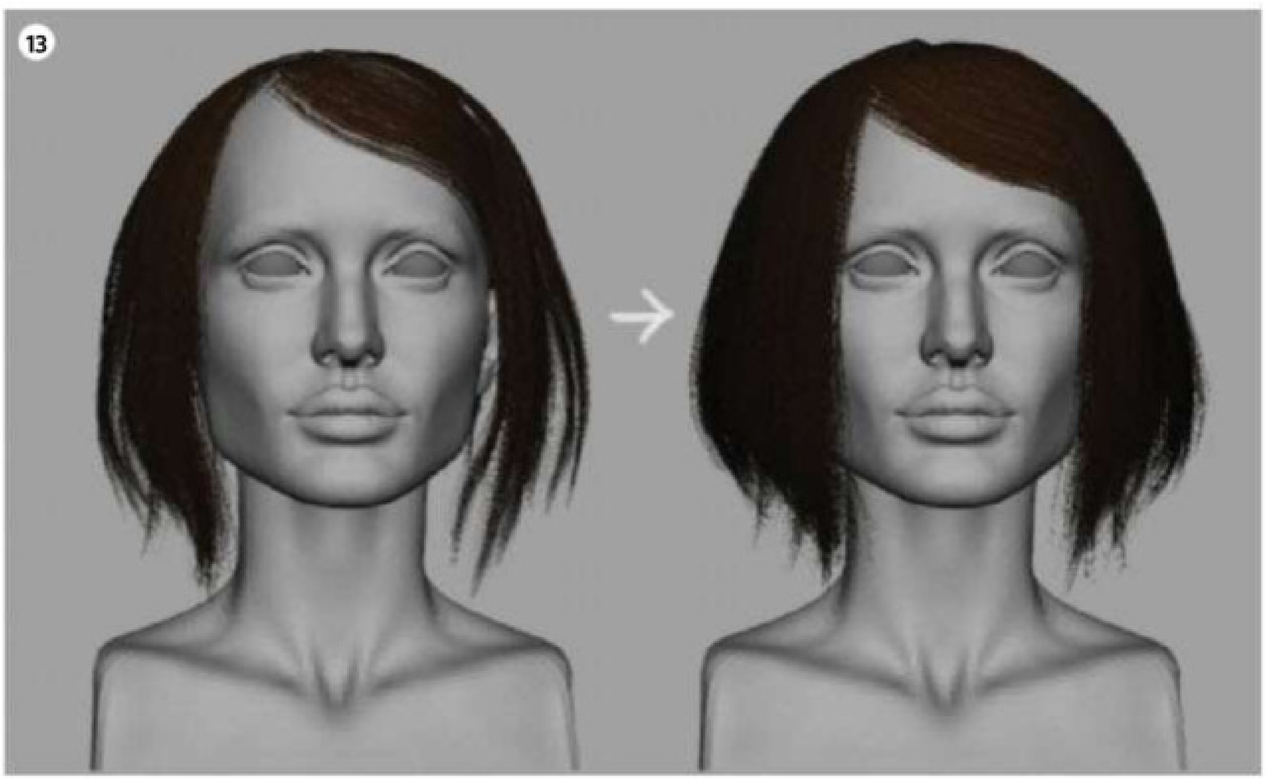
Your reference will decide whether or not you achieve believable results. Make sure to search out for good images but also look to real life. Look at your hair in the mirror, or random people in the street to see how it reacts to the light and what you can do to achieve similar results. PBR is all about material definition, so make sure you really nail your materials.

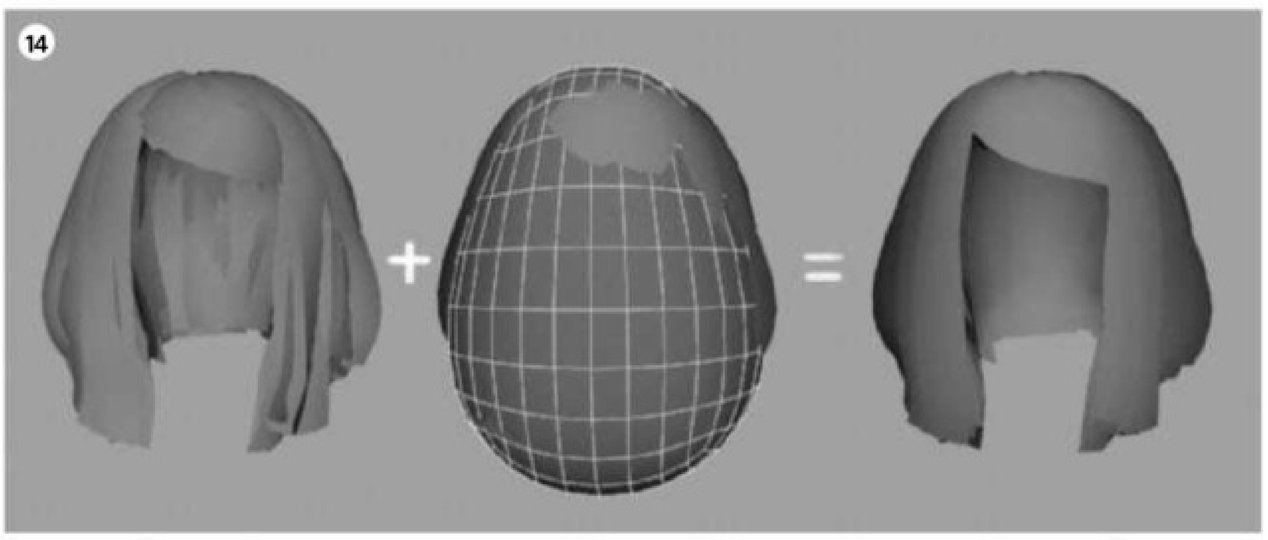


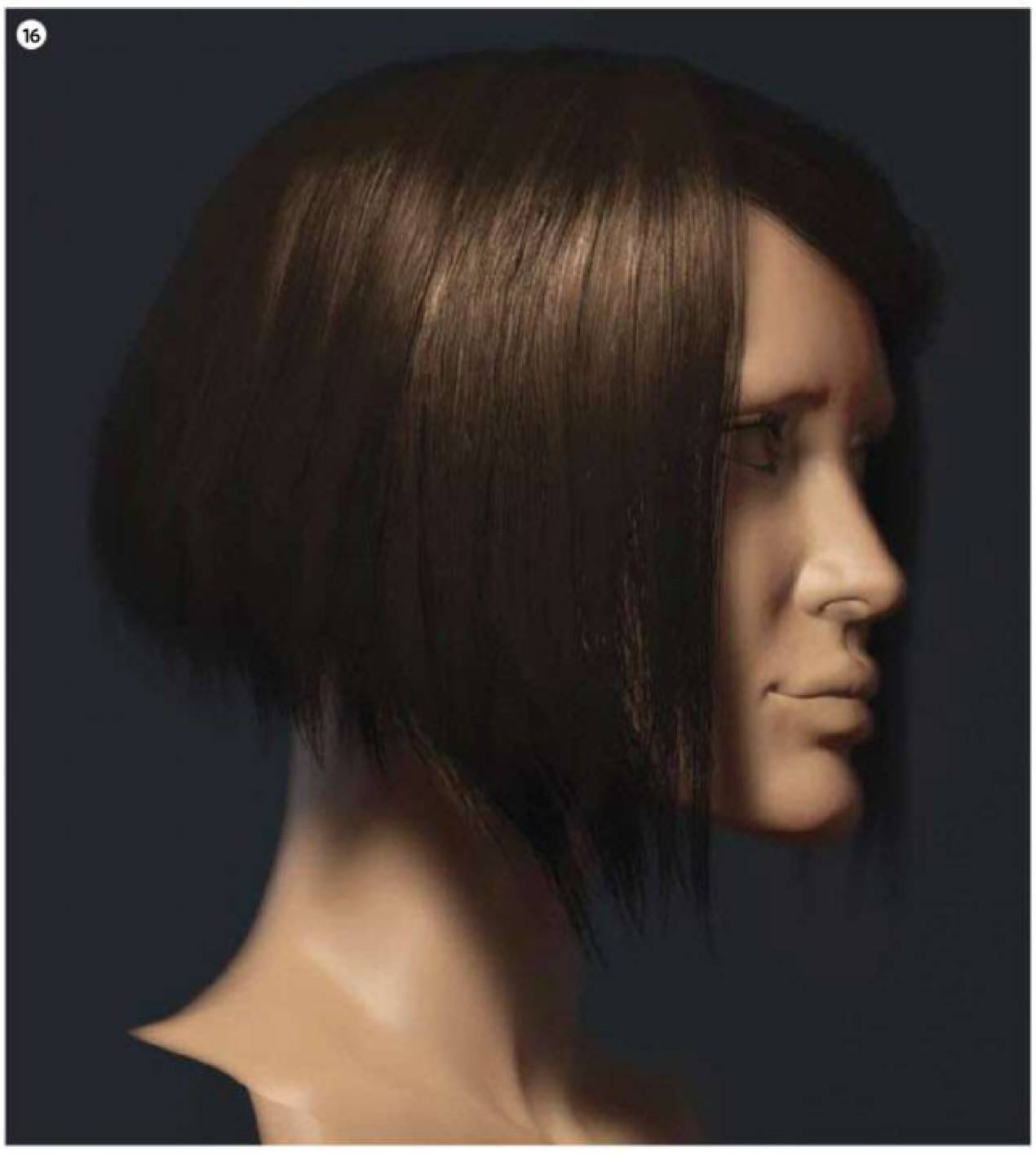
**13 Tweak the meshes** With our base textures ready, we can see how the model holds up. With this workflow you start by working blind, so it does require a bit of cleaning. We can duplicate shells and use Soft Selection to pull them around, then concentrate on filling gaps and getting a nice flow to the hair. This is also a good stage to get the model into Toolbag 2 as well, so you can see how it's working and if you need to tweak your textures or meshes at all.

**14 Transfer Vertex Normals** This stage is often overlooked but as each hair strip has a hard-edged border, it means the normals will give you a separated look. To rectify this, simply create a proxy mesh to transfer the normals from using Maya's Transfer attributes. If you have a short hairstyle then sometimes you just need to use the head mesh itself to transfer normals from. If you are a 3ds Max user, there are also a load of scripts available for this.

**15 Set up Toolbag 2** A good way to derive values from Toolbag 2 is to set up proxy materials for each surface. In this instance we are just making one for the hair. Using the Colour Picker we can get RGB values for the Albedo. The Gloss slider will give us a black percentage and for our Specular / Reflection we will use a solid colour to reduce texture maps. Now transfer these to Photoshop and replace the values with the textures. Check constantly between your texturing software and Marmoset to check your results.






## Short hair

Shorter hair is a different beast, so it's sometimes better to use the traditional approach of using curves or just make meshes in your 3D app and arrange them in there. For the texturing process we can still use the ZBrush approach. Remember, beard hair is ever so slightly thicker and eyebrows are thin, but rely heavily on direction. For eyelashes I'd create a high-poly and then bake a strip.

**16 Make final tweaks** To get a truly realistic result, I like to change the shader to a skin shader – this means we have better control over our normal smoothing and shadow blurring. Also, we can create a secondary specular as an anisotropic gloss. In here we can control the strength, direction and position of the highlight. Using a Point / Omni light we can get some nice soft shadow information also. The final step is to hit Capture to increase the sampling and give you an external screenshot, as well as nicer results for your Alphas.



• **DID YOU KNOW?** • All tutorial files can be downloaded from: filesilo.co.uk/3dartist-76

Working with 8PACK Global #1 Overclocker

# RENDA

PROFESSIONAL WORKSTATIONS

8PACK
GLOBAL #1
OVERCLOCKER

## FREQUENCY ENHANCED WORKSTATIONS BY THE EXPERTS

5 Year Warranty • Built & Stress Tested • Configurable

OVERCLOCKERS UK

## www.overclockers.co.uk/renda

FREQUENCY ENHANCED WORKSTATIONS DESIGNED & ENGINEERED BY THE EXPERTS

Featuring Intel® Core™ i7 processor | Work and play with Intel Inside®

Intel, the Intel Logo, Intel Inside, Intel Core, and Core Inside are trademarks of Intel Corporation in the U.S. and/or other countries.

intel inside™ CORE™ i7

# Technique focus

**Incredible 3D artists take us behind their artwork**

**CHARACTER CREATION** German art director Thomas Koch had the initial idea and retouched the piece. We created a current, cute and charismatic character. I made many drawn studies, then we chose one to create in MODO. For the reliefs I used Bump because it is faster than Displacement. We also had five types of fur. **In Love With a Ferris Wheel, 2014**

Henrique Cassab Sasajima

3DArtistonline

**Username:** Henrique Cassab

**Website** www.be.net/henriquecassab

**Country** Brazil


**Software used** MODO, Photoshop

[RE]VOLUTIONARY

## CALL FOR SUBMISSIONS

**Submit your best work from February onwards:**

Become a presenter at SIGGRAPH Asia 2015! The SIGGRAPH Asia 2015 committee cordially invites you to submit the project that you are proudest of. From fresh concepts to game-changing ideas that can be built upon to drive innovations. We welcome all submissions and look forward to seeing you in Kobe, Japan!

**Art Gallery**
**Computer Animation Festival**
**Courses**
**Emerging Technologies**
**Posters**
**Student Volunteers**
**Symposium on Education**
**Symposium on Mobile Graphics and Interactive Applications**
**Symposium on Visualization in High Performance Computing**
**Technical Briefs**
**Technical Papers**
**Workshops**

**CONFERENCE** 2 - 5 November 2015
**EXHIBITION** 3 - 5 November 2015
**KOBE CONVENTION CENTER, KOBE, JAPAN**
**SA2015.SIGGRAPH.ORG**

Sponsored by

3DArtist

# Questions & answers

Our experts answer your technical quandaries for the most popular 3D programs. Simply email your questions to:
3dartist@imagine-publishing.co.uk

## Need help fast? Join the

The advisors

### 3ds Max
**Digital-Tutors**
www.digitaltutors.com

Digital-Tutors helps artists and designers all over the world learn proven creative skills that they can use to create stunning movies, games, projects and much more

### FumeFX
**Vikrant Dalal**
project01studio.blogspot.in

Vikrant has over eight years of experience in the VFX industry. His company Project01 Design Studio works with international clients and produces 3D tutorials

Download
**Tutorial files:**
- Tutorial screenshots
- Scene files
- Final animation

filesilo.co.uk/3dartist-76

# Animate fight moves

## “Which are the techniques and workflows for animating believable fight moves in 3ds Max?”

**Animating fight moves can be a difficult thing to tackle, as there are many things involved in order to get it to look believable.** Animating anything with an emphasis on body mechanics will pose challenges, but creating a very physical animation is a rewarding experience when you get it right.

In this tutorial, you will learn the techniques and workflows involved in animating fight moves, whether you're creating them for a videogame or a movie. We will start with the basics: a rough idea of what we want to accomplish and lots of video reference. With any animation you do, video reference is your best friend because you need to recreate reality and there is no better way to do that than studying it.

One of the great things about animating fight moves is that it's probably one of the most fun video references to find and create. Whether you're watching your favourite Bruce Lee movie or the epic battle scenes in the *Lord Of The Rings* trilogy, you're bound to get some awesome ideas for your own animations.

The next step is to determine how you want to go about animating; you could do a pose-to-pose method, straight ahead, or a mixture of both. You will also want to decide early on whether you want to start with Stepped Tangents or Spline Tangents. There are going to be pluses and minuses for both methods.

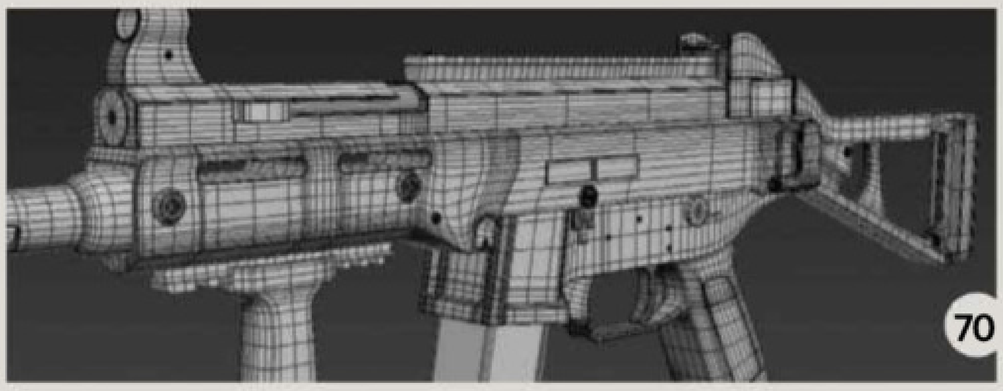
In this particular tutorial, we've taken a straight-ahead approach and started in Spline mode right off the bat. The reasoning for this is because we want to make sure that the timing and spacing is correct early on, and that we know each transition works. We want to put an emphasis on weight in this shot, so we know we also need to see if this particular action has the weight we want it to have right from the start. Working straight ahead also lets your ideas flow more fluidly and it's a sort of spontaneous way of animating. Of course, you're still following closely with your reference and the overall idea for the shot, but you can come up with some pretty cool actions by not being completely constrained to a pose-to-pose method.

This shot is going to be around 150 frames and you can find the project files included on FileSilo for this issue if you want to follow along with the tutorial.

## Smart Skinner

**Brent J Zorich**
**www.bzppro.com**

CEO of BZP PRO, best practices committee alum of Lucasfilm, TD at EA Sports and 2K, DreamWorks Outreach Program participant, interior architect at Gensler and NBBJ




Send us all of your 3D problems and we'll get them sorted. There are four methods to get in touch with our team of expert advisors...

**Get in touch...**

3dartist@imagine-publishing.co.uk
facebook.com/3DArtistMagazine
@3DArtist www.3dartistonline.com

### 01 Gather video reference

Video reference is key to creating a believable body-mechanics shot. Find some video reference online or bust out your camera and start filming, experimenting with different moves. Don't stop after your first take or idea – keep going and play around with different actions. It's likely that you'll be able to take different moves from different takes; you might like the swing in one clip and the kick you did in another.

### 02 Plan the animation

It's always a good idea to jot down some quick thumbnails for your animation. You can do this based on your video reference or just experiment with different poses. If you have good video references, you can use these as the basis for the timing of the actions. Try to push your sketches further than what you have in your reference and exaggerate the poses to create more appeal. Video reference is great, but you don't want to be constrained by the poses.

### 03 Apply the constraint for the weapon

For this shot, the character is holding an axe, so you need to apply a couple of constraints. You can either constrain the axe to the hand or the hand to the axe. When working with weapons like this, it's actually much better to constrain the hand to the axe, so you can animate the axe instead of the hand. This works better because you're able to create smoother arcs. If you were to do it the other way around, any rotation or movement on the arms would echo twofold at the tip of the axe. The arcs on your wrists may look good, but not on the axe. If you don't want to go through the process of setting up the constraints, you can find the scene ready in the Character_Setup.max file that's available to download from the FileSilo site.

### Overlap action

Don't be afraid to start thinking about overlapping action and follow-through early on in the animation process. You don't want to start offsetting keys in the early stages, but you can begin to incorporate these principles into your actual poses.

## 04 Animate the first pass

It's now time to start animating the shot! For this, begin at frame 1 and work through the animation from there, going off your video reference and thumbnails. If you're working in Spline mode it can be hard to visualise your shot because things can look very floaty, but at this stage you want to be more concerned about the posing and the rough timing. Continue working through your shot straight ahead, one pose to the next. For this particular animation there has been a total of 28 key poses for the first rough pass. You can see in the scene file that the animation is really halfway there. Working in Spline mode at the beginning, you can see where breakdowns need to be included.

## 05 Animate the second pass

At this stage the animation is still in its relatively rough stage. There are more key poses than what is typically in a first pass using the pose-to-pose method, but it's still very easy to shift things around. In this pass you want to start adding in more breakdowns. Get the transitions from each pose to the next working well. You don't want to start offsetting keys yet, but you can incorporate overlapping action and follow-through in the actual poses themselves.

## 06 Refine the poses

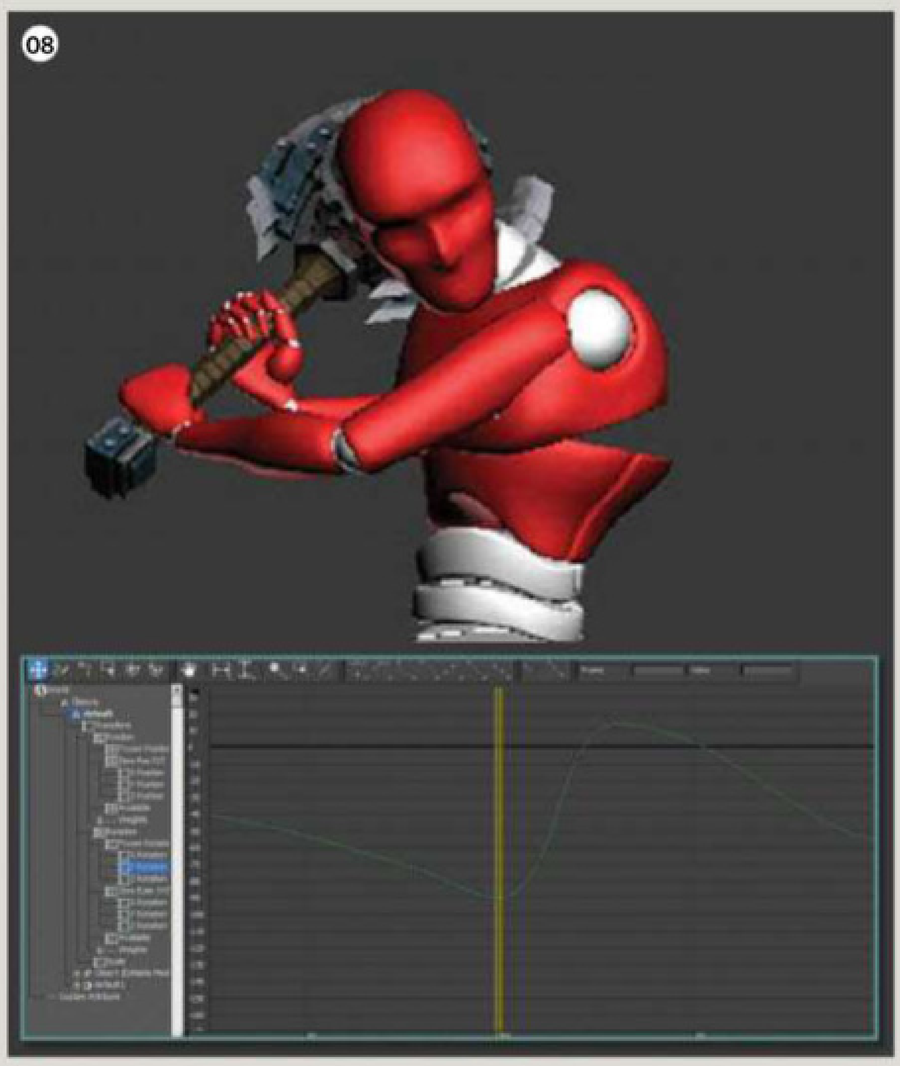
After you've finished the second pass of the animation, it's now time to go back in and start refining the poses further. You'll probably notice several areas where things need to be pushed. For this we knew we wanted the axe to feel very heavy, so we went back in and pushed the poses where he was lifting and swinging the axe. We also exaggerated things like the anticipation before he lifts his leg for the kick. The great thing about working straight ahead is that you very quickly have the building blocks for your animation, and it's now time to start really refining it further.

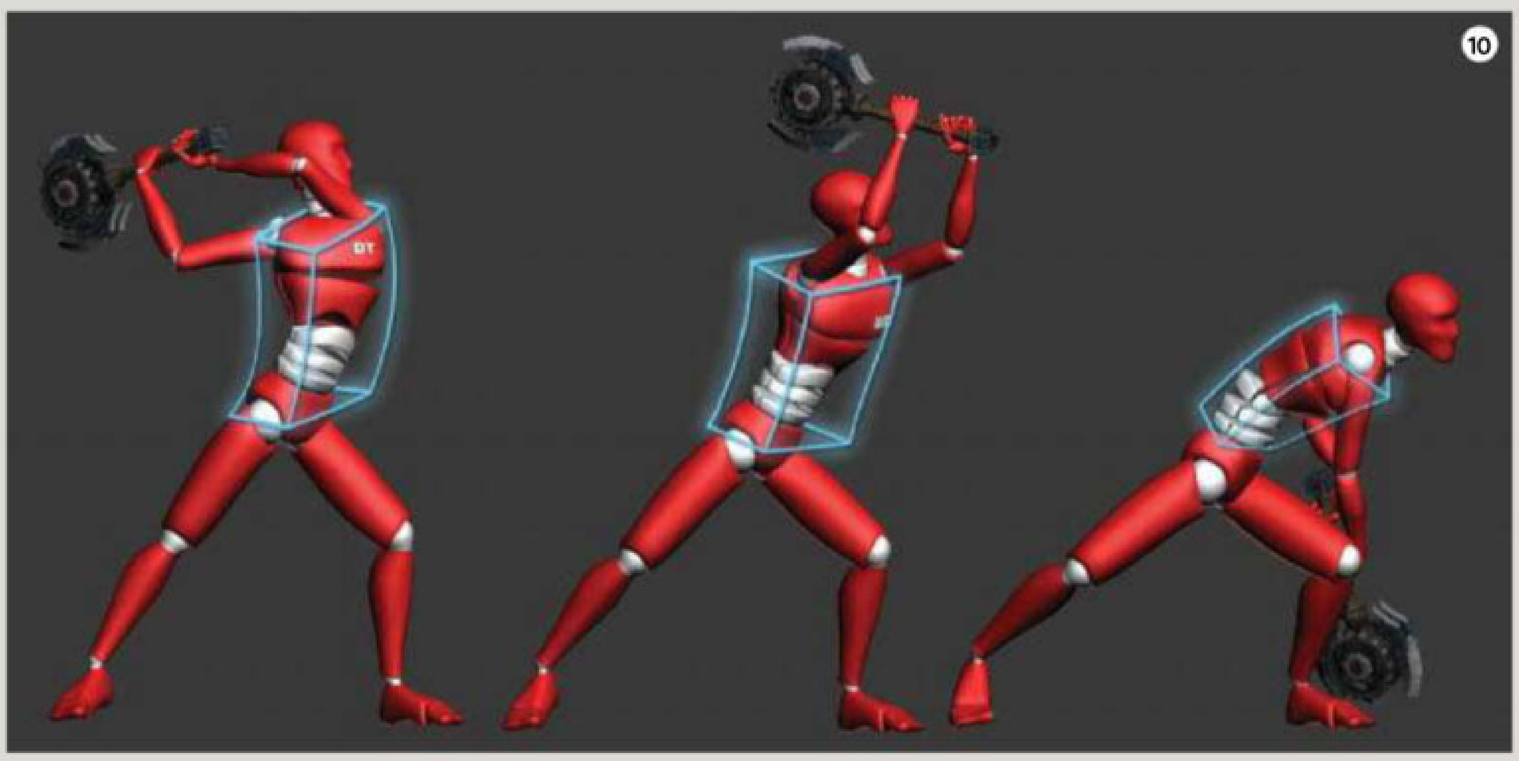
## 07 Adjust the timing

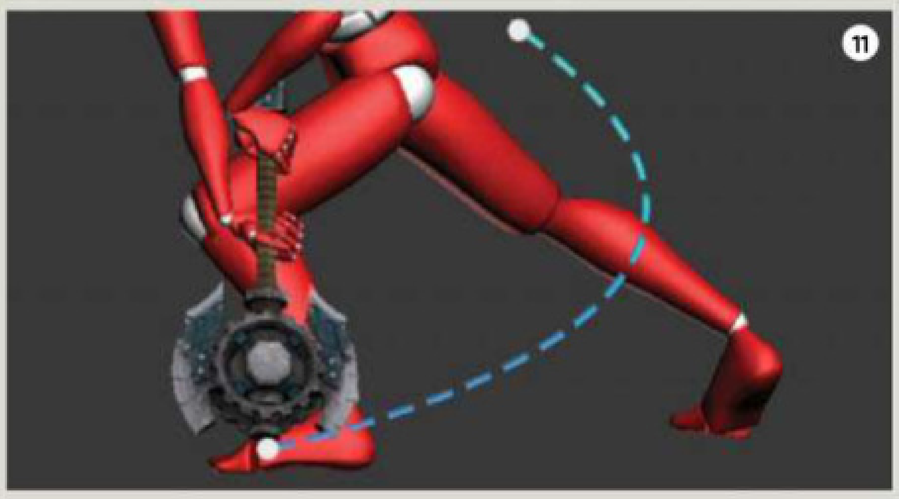
Up until this point, the timing has been based on video reference. This is great to do for a basic timing structure, but timing in real life is often boring, so it needs to be pushed. Again, we wanted the axe to feel very heavy so we went back in and sped up a lot of the swings, and sped up the timing on the kick to give it more power. The shot overall has had about 20 frames trimmed off from the original timing. Timing is obviously very important in selling the weight of something, so you need to make sure it's right.

## 08 Tweak the spacing

Another very important factor in getting the weight to feel right is in the spacing. It needs to feel like his body is being pulled in the direction that the axe was going. Begin by paying close attention to the spacing on the

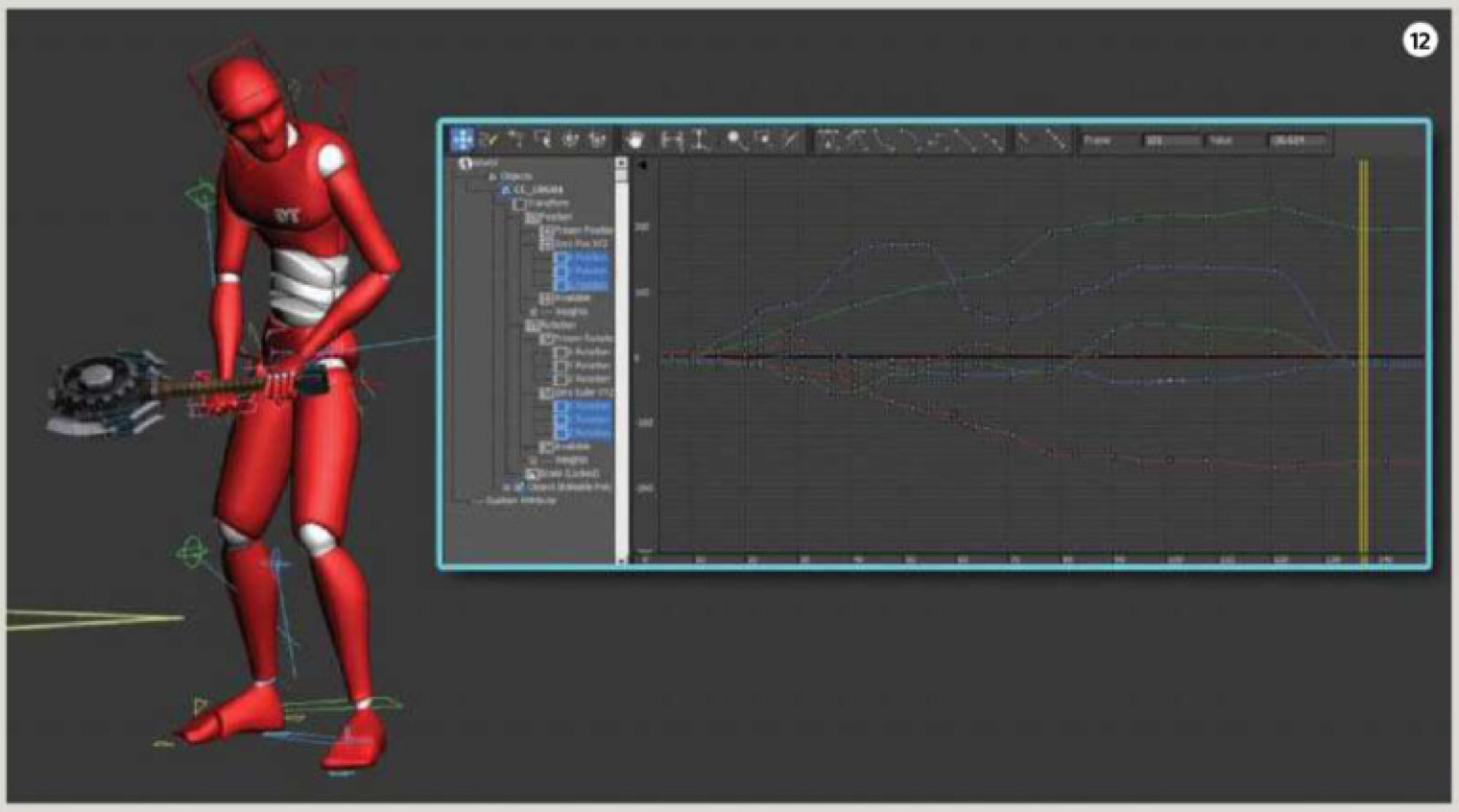





## Work straight ahead

A benefit to working straight ahead and starting in Spline mode is that there won't be any surprises in your animation, and you can see exactly when something looks wrong. Working pose to pose, it's hard to see the entire action until you convert your tangents to spline curves.




axe. The spacing should be very close together during the moments when he is preparing for the swing, but midway through the swing is when gravity starts to take over and therefore the spacing becomes very far apart.

### 09 Break things up

Up until this point there hasn't really been any offsetting of keys because it had to be very easy to adjust the timing as needed. You want to start making things happen at different times. For example, as he brings his foot down from the kick you want to make sure his foot plants before his weight is transitioned over. Find places where you can break up the timing between different parts of his body. You want to make sure that it makes sense, though, as you don't want to offset keys just to do it. It should enhance the movement.

### 10 Incorporate overlap and follow-through

Now it's time to start thinking about follow-through and overlapping action. One very important area to incorporate follow-through is in the final swing. It needs to feel like the axe is really leading his body, so as he finishes the swing, the axe still has a lot of momentum that causes his body to continue to move in the direction of the axe. This helps to sell the weight. You also need to add in overlap in his chest during the swing down. Everything needs to move at a different time. For example, his hips should begin rotating, then his lower chest and finally his upper chest.

### 11 Track arcs

The next step is to begin tracking the arcs, especially on the axe. Frame-by-frame the path that the axe is taking and make sure that it's travelling in a nice arcing motion. In addition, you want to track the arcs on the hips to make sure that as he is moving forward in space, there are no strange hiccups in the arcs.

### 12 Final polish

The final step is to go in with a fine-toothed comb and really polish the animation, adding anything to the animation that will be the icing on the cake. For instance, as the character is lifting the axe up, he takes his hand off for a moment as he adjusts the position. It's a very small touch, but it's those little things that will help add that final polish. You can also go in and make sure that the animation curves in the Curve Editor are smooth and there aren't any hiccups within the curves that could be messing up your animation.

• **DID YOU KNOW?** • All tutorial files can be downloaded from: **filesilo.co.uk/3dartist-76**

# Questions & answers

Our experts answer your technical quandaries for the most popular 3D programs. Simply email your questions to: 3dartist@imagine-publishing.co.uk

**Download**

**Tutorial files:**
- Tutorial screenshots
- Reference links
- Scene files

filesilo.co.uk/3dartist-76

# Model a weapon

## What are the key steps to modelling a gun for a next-gen FPS in 3ds Max?

**In this tutorial we'll be creating the UMP45 for a first-person shooter game.** There are many things that go into modelling a weapon, and guns can be some of the most difficult things to tackle because there are so many complex shapes that need to be created in order to make a believable firearm.

When approaching such a complex model, it's smart to work logically and to do a decent amount of planning beforehand. A gun obviously can't be modelled from one single piece of geometry, so it's much easier to break your model up into bite-sized pieces. For example, the stock can be separate along with the upper-receiver and lower-receiver. It's also helpful to search online for the gun's schematics to see how the pieces fit together. Guns in real life are not made up of one single piece of metal; your model should be the same way. Guns are also meant to be taken apart for cleaning, so it's logical to have your model separated where it's actually separated on the real-world gun.

If you're creating any type of weapon from a real-world reference then you will need to think quite carefully about real-world scale. How large is the gun in real life? In this example the UMP45 is about 27 inches long with the stock extended. Since we are creating a weapon that is going to be used in a game, we need to think about how the scale works in your game engine. Most game engines work in centimetres or metre units. 3ds Max's default unit scale is inches, so this is something that you'll need to set up beforehand. In this case, we went with a centimetre scale, so the 27 inch UMP45 comes out at around 68 centimetres in 3ds Max. This will also help you decide how big your reference image needs to be.

If you're modelling a gun to be used in a videogame, it's usually best to first create the high-poly model and then retopologise it after. There are a few reasons for this. You don't want to constantly think about if you're staying within your polygon budget. Instead, you want to make the most accurate representation of the real-life gun and retopologise it later. You also don't know if you'll need to use the high-poly version at some point, for example in the game's cutscenes where high-res models are often swapped out.

01

## 01 Get a reference

Gathering reference images is a vital part of modelling a weapon, especially a real-life one. No matter how familiar you may be with guns, you need to have not only orthographic reference images for your model inside the 3D application, but you also need as many images of the gun as you can. Get side views, front views, and perspectives. It's not always easy to tell what needs to be extruded, bevelled and so on if you're just working from a side-view image. We weren't able to provide the reference images we used unfortunately, but you'll be able to find some online.

## 02 Break down the gun

Once you've found reference images it's time to break them down into easy-to-understand sections. A gun consists of many different parts, and these parts will all need to be modelled separately. Start with a game plan: what needs to be modelled first, and what sections of the gun are going to be separate. Take your reference image into a program like Photoshop and split up the sections on the gun that you want to model separately. This will give you something to refer back to as you're modelling.

## 03 Block in the gun

With the Scene_Setup.max file opened, begin modelling. Start with the gun's lower receiver, which is the area where the handle, magazine and trigger lie. We started with a simple plane, and used an edge-modelling approach to block in the lower-receiver. When happy with the shape, extrude it to create the thickness. Don't worry about details like extrusions and bevels, get the basic shape and work in the details from there. Next, the upper receiver was blocked in. This is the area where the shell ejector is located and houses the barrel. After that the stock was blocked in, and finally the upper area of the gun where the rail sits along with the gun's sights and cocking lever. It's important to know what parts of the model can be mirrored across and what needs to start out as a single piece of geometry. For this only half of the lower receiver was modelled, then it was mirrored across. The same was done with the upper receiver and stock. However, the upper area of the gun where the sight lies was not mirrored across because only one half of the gun houses the cocking lever.

## 04 Refine the shape

With the gun blocked in, you can now start adding in the smaller details and really get every extrusion looking how it should. This is the time when you'll start cutting out some of the areas on the gun, like the two holes along the grip of the weapon. Be mindful of your topology. Try avoiding triangles and n-gons if you can and make sure that you're rerouting the topology along the areas where you had to cut out the geometry. We've also started mirroring over the other pieces of the gun like the lower receiver, the upper receiver and the stock.

## 05 Add in the details

This is where you can start to add in all the fine details on the gun, like the bolts and additonal details such as the semi-auto and full-auto switch above the trigger. We've also added the hand grip on the bottom rail to make it feel like a more finished piece. You don't have to stop there though; you can go as far as to add things like an ACOG or Red Dot sight to the top rail or a suppressor for the end of the barrel.
You can now move on to smoothing the gun. We've applied a TurboSmooth to all the pieces and extra edge loops were added to keep the hard edges and creases where we want them.

## 06 Retopologise

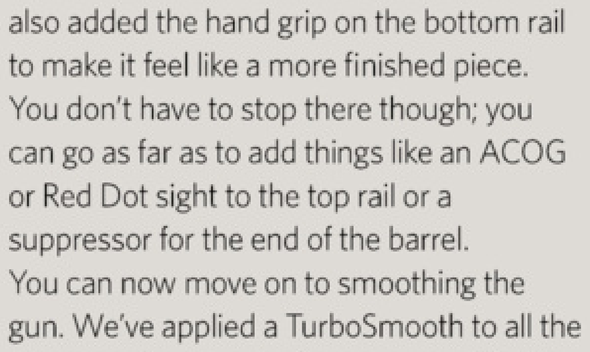
The last step before you or someone down the pipeline starts the UV and texturing process is to retopologise the model. This is a tedious process, but it's something that needs to be done. Since we first created a high-res version, it now needs to be cut down to a more manageable polygon count. As this model is intended to be used in a first-person view, you still want to have a relatively high polygon count because it's going to be close to the camera.

02

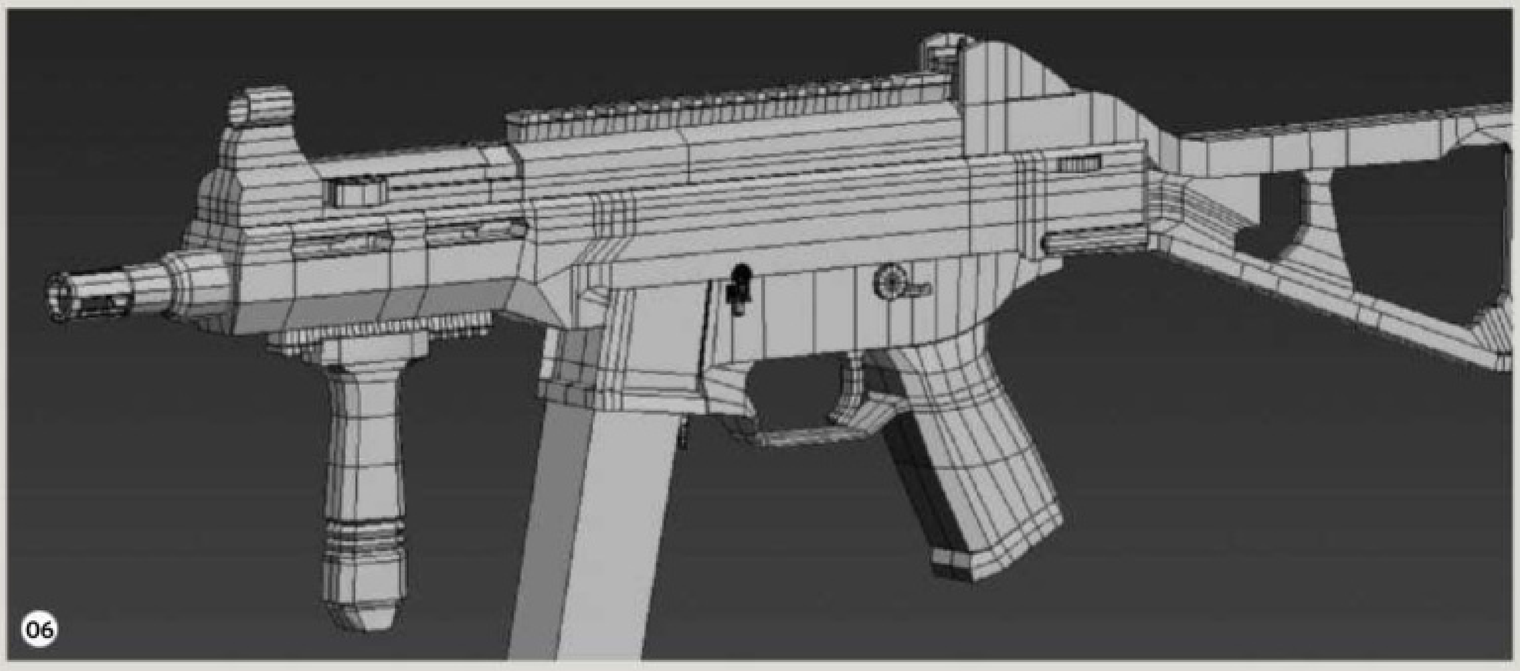
03

### Think about perspective

Depending on where this gun is going to be used, you may not have to model every single piece on it. For example, in most first-person shooters, the player will only see the left side of the gun so there is no need to model things like the shell ejector if the player will never see it. This will also help to save the polygon count.


04

05


06

• **DID YOU KNOW?** • All tutorial files can be downloaded from: filesilo.co.uk/3dartist-76

Our experts answer your technical quandaries for the most popular 3D programs. Simply email your questions to: 3dartist@imagine-publishing.co.uk

**Download**

**Tutorial files:**
- tornado.MAX file
- tornado.AEP file
- Video tutorial
- Tutorial screenshots

filesilo.co.uk/3dartist-76

# Create a tornado effect

## “How can I create a tornado effect using 3ds Max and the versatile FumeFX plug-in?”

**Tornadoes are very interesting-looking weather phenomena, they can vary in shape, size and are very much dictated by movement.** In this tutorial we are going to take a look at how you could make one, like those seen in films such as *Twister*, *The Day After Tomorrow* and *Into The Storm*.

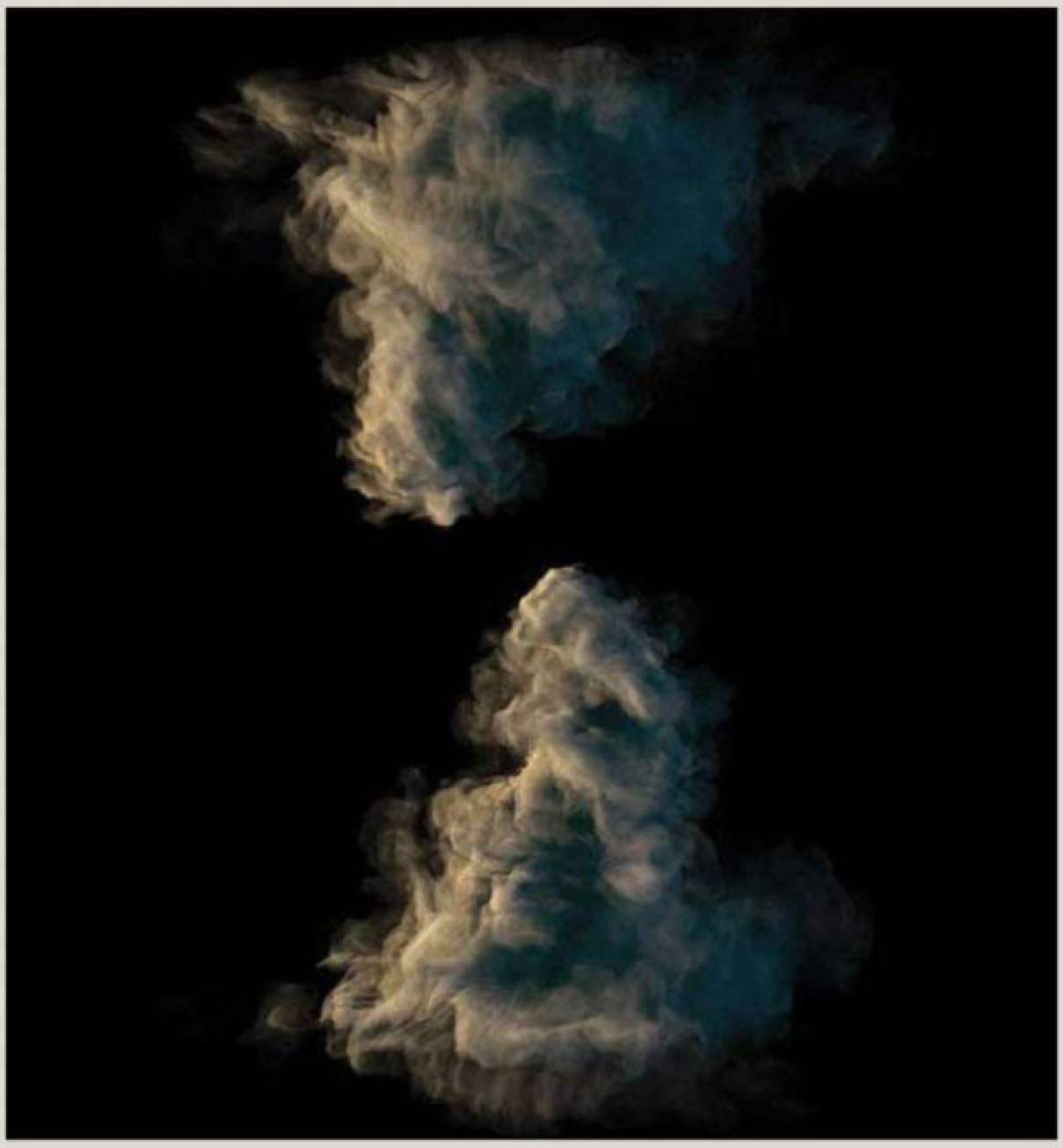
There are number of plug-ins in 3ds Max, which can create the tornado effect such as FumeFX, Afterburn and Phoenix FD. Many larger VFX and animation studios use FumeFX software in their processes, as this software gives good output, is trustworthy and most importantly – it's user-friendly.

To create this effect, we are going to use 3ds Max and FumeFX plug-in. There is quite a lot to learn in order to get to grips with each and every parameter of this software and it would take a lot of time to go through. As far as the tornado effect is concerned, we will learn as much as required for this particular tutorial only.

There are different techniques you can use to make this effect in FumeFX. Simple Source, Object Source or Particle Source, but we are going to use Object Source.

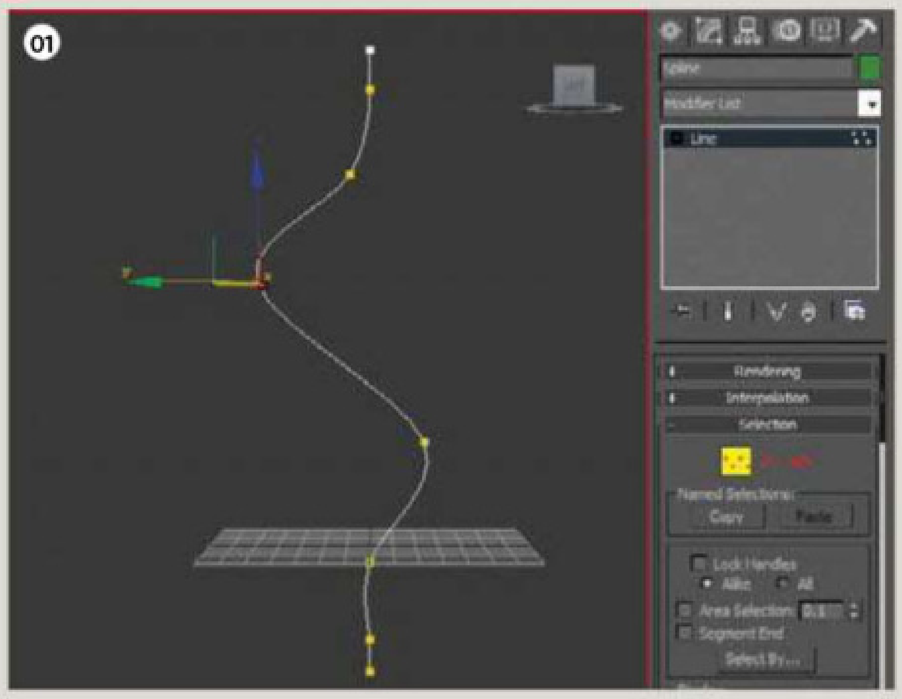
Before you start working on this kind of effect, you should have a good knowledge of real-world scale. You must know the height and diameter of the tornado, the rotation speed, the amount of wavy movement and the speed it travels from one place to another – a combination of all these factors will decide the scale of tornado. There are many different types of tornadoes that form in real life, for example landspout, multiple-vortex tornado, waterspouts, supercells, dust devils, gustnadoes and many more. So you should check which type you are referencing first before you start work on the shot.

This is very interesting subject because you can't define one certain process to create this effect. It very much depends on your own understanding of using tools and techniques. As you use your creativity and tools, you will find different types of effects every time. So let's get started!



## Create tornado using Particles

In this tutorial we have used FumeFX Object Source. However, if you're capable using Particle Flow System, then you can also create effective output. You can use various space warps to control particles and give it a good shape, so it's easy to control particles for things like speed, rotation and turbulence. Then you simply have to add these particles into FumeFX Particle Source. If you are using FumeFX Simple Source or FumeFX Object Source then you can use Space Warps. Use Wind Space Warps for turbulence and Vortex Space Warps for tornado rotation, but remember, you should keep the parameters high for the Wind or Vortex while working in FumeFX compared to working with Particle Flow System.

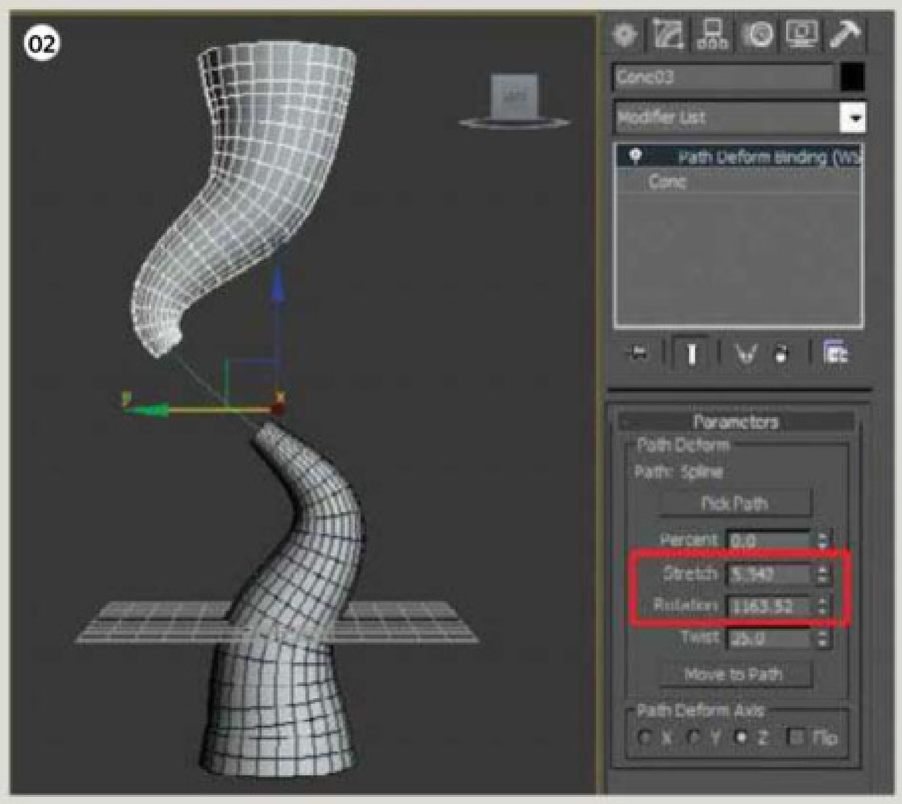



### 01 Create and animate the spline

To achieve our tornado effect, we need to create the base model of a tornado, because we are going to animate the object in the same way as a real tornado. We will use two cones and one spline; one cone will come from the top and one from the bottom to meet in centre. To animate these cones we will use a spline. So, to create the spline go to Create> Shapes> Line. Draw a straight line, go to the Modify panel and add three to five vertices with the help of Divide. Turn on the Auto Key and animate every single vortex. This motion should look like real tornado behaviour. There are two ways to animate this spline, the first is Manual Animation, which we have used, and the second is to select all vertices except the first and last, then assign the Noise modifier on top of them. Turn on the Animation option and adjust it as you require.

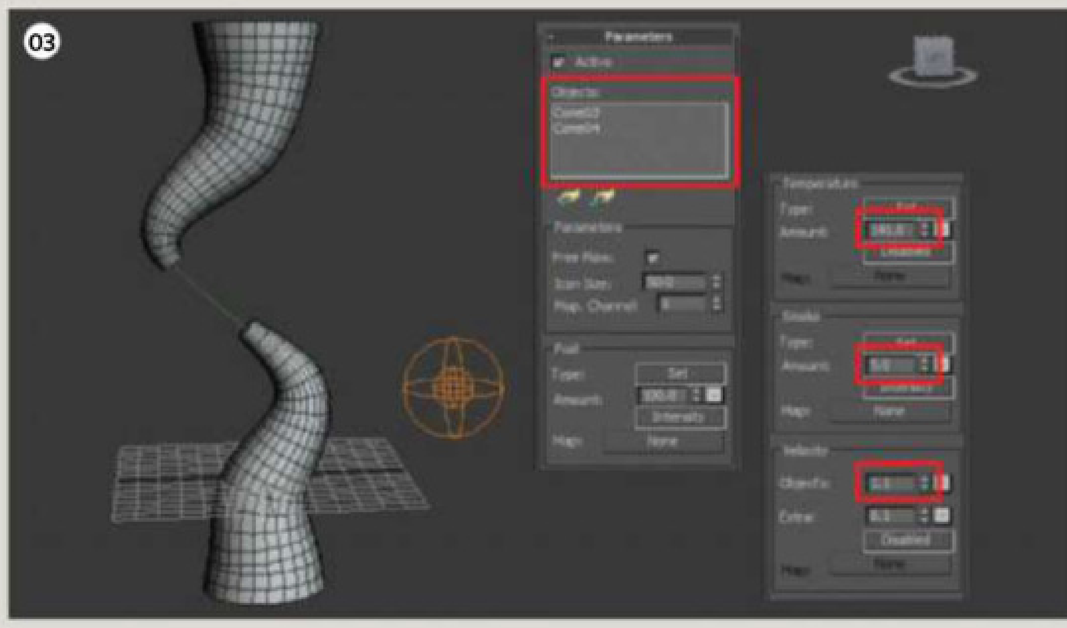
### 02 Create cones and animate them

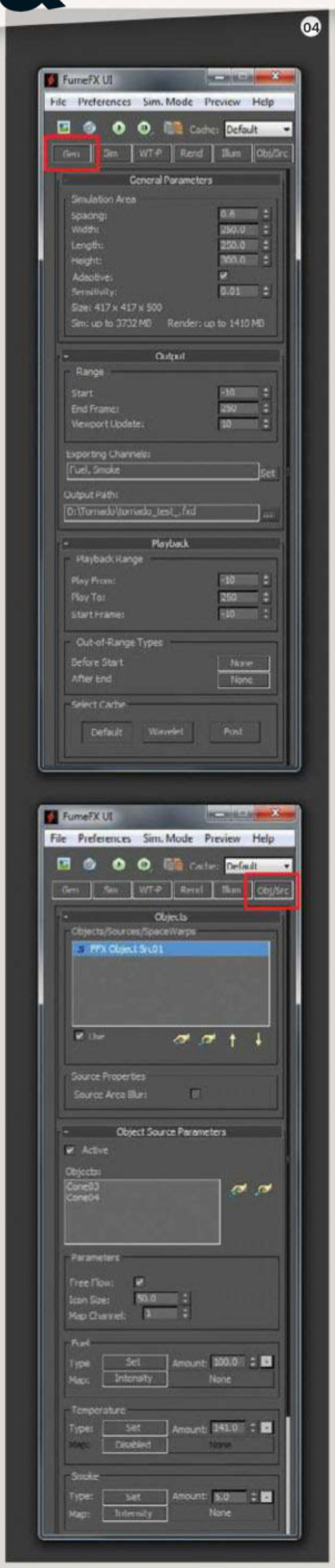
In this effect we want to show two tornado parts coming together to form one tornado. Similar to actual tornado footage, one tornado comes from the clouds and the other generates from the ground to merge in the centre. To create this effect we will use two cones. Create cones from standard primitives, then add a Path Deform Binding modifier to both cones. Then click Pick Path and select the animated spline, which we have already created. Now animate the stretch parameters as per the requirements. We need to animate the Rotation Parameters too, because real tornados continuously rotate in one direction. So after you've finished the animation and editing of the parameters, we can see that our base model (cones) is ready to generate the smoke. You can use my 3ds Max File with the base model, that is free with this issue.

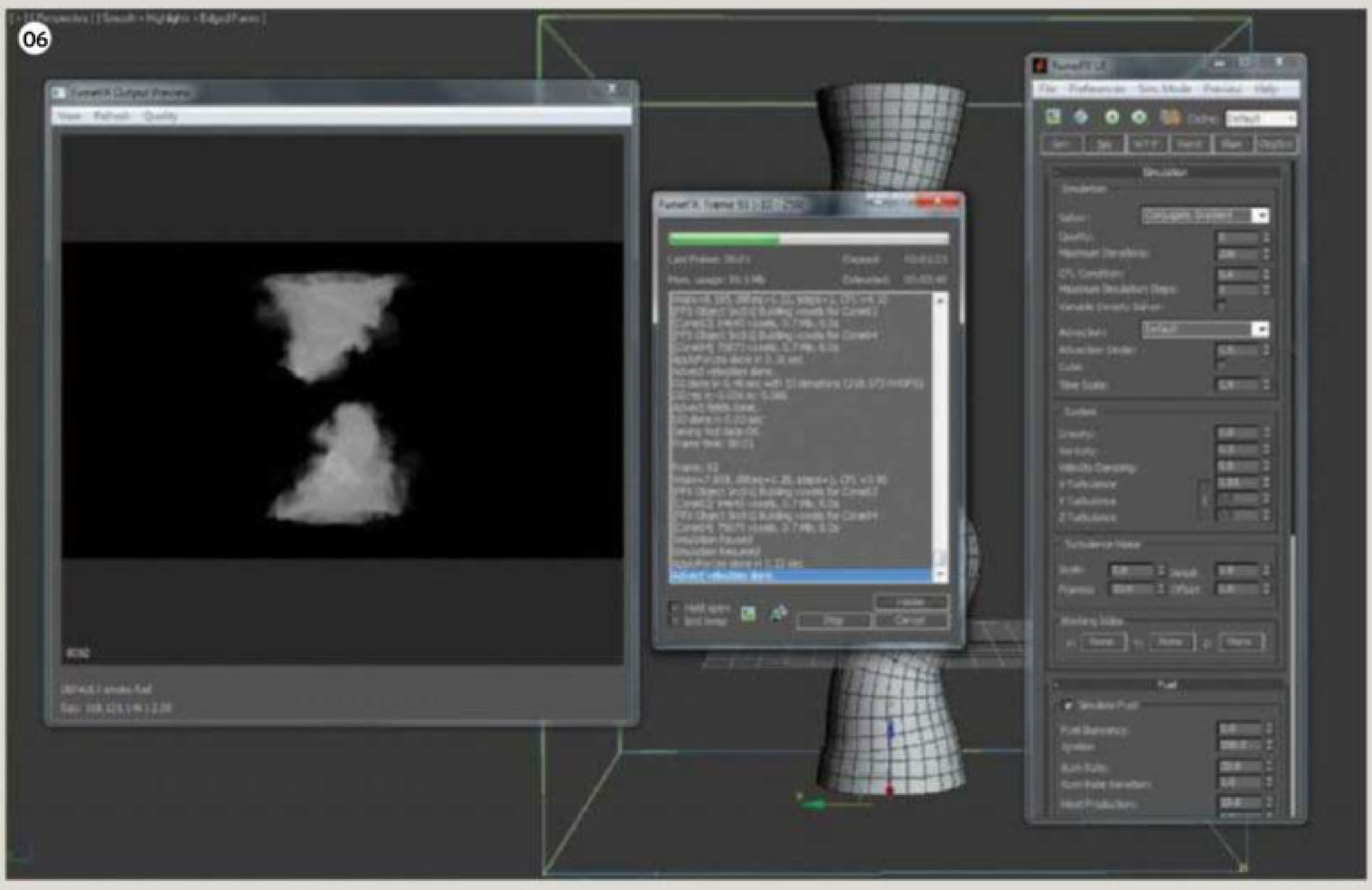



### 03 Create FumeFX object source

Now it's time to create our important element, which is the 'smoke'. To create smoke, we will need two things: one is FumeFX Object Source and the other is FumeFX Container. With the help of FumeFX Object Source, we will generate and control the fire and smoke that emanates from the objects. To create FFX Object Source, go to Create Panel > Helpers > Click on dropdown menu > FumeFX. Click on the Object Src button and generate in viewport. Now rename this 'FFX Object Src' 'Tornado_Emitter', now select it and go to modify panel and add our both cones in to Object tab. Don't change anything in Fuel, just change the Temperature with the amount of 140, Smoke 5.0 and Object's Velocity 1.1. This is as simple as that.








## 04 Create FumeFX Container

Let's create our FumeFX container. To create this container, go to Create Panel> Geometry> then click on the drop-down menu and select FumeFX. Next select the FumeFX and generate the container in viewport, then modify its parameter. Let's start with General Parameters; make the Spacing 1.0 and the Size 250x250x300, then set the output and playback range from 0 to 250. Then navigate to Output Path, make a new folder on your storage drive and save your cache file as 'tornado_test' in the new folder. After you have finished the editing of general parameters, go to 'Obj/Src' and add our 'FFX Object Source' in to object tab. Once this is done, we can move ahead to the simulation section.

## 05 FumeFX simulation parameters

In the simulation section, begin by making the following settings. Keep everything as it is except Time Scale – set this to 1.9. Now move ahead to System. Set Gravity to 0.0, Vorticity to 0.3 and Turbulence to 0.03. For Turbulence Noise set Scale 5.0, Frame to 10.0 and Details to 1.0. All of X, Y and Z should be set to none in blocking sides. Now go to Fuel Parameters and keep everything as it is. Last of all, set the Smoke Dissipation Min Dens to 7.0 and Dissipation Strength to 10.5.

## 06 Start the simulation

We have already made all the necessary changes in the FumeFX Object Source, so there is only one thing left to do: the simulation itself. So just hit the Simulation button. It will take around six to seven hours to simulate 250 frames. It all depends on the details of smoke and scale of the scene.

### Use real footage

In this tutorial, we have created our tornado on a plain black background. But you don't have to stop there! To make the tornado look even more authentic, shoot any live scene using a handy cam and try to merge your tornado into that footage. From here you can create a complete visual-effects shot, from shooting, camera tracking, FX and compositing. Also remember to add extra elements to your scene, for example dust, debris and other objects.

## 07 Tweak FumeFX rendering parameters

After the simulation is finished, it's time to assign some colour to the smoke. We will turn off the Fire tab, because we only want the smoke element, so let's start with ambient colour. Set the ambient R:0 G:0 B:0, with the smoke colour set to solid colour, make it R:88 G:111 B:139. The opacity should be set to 1.0 and both the cast and receive shadows boxes ought to be checked.

## 08 Modify FumeFX illumination parameters

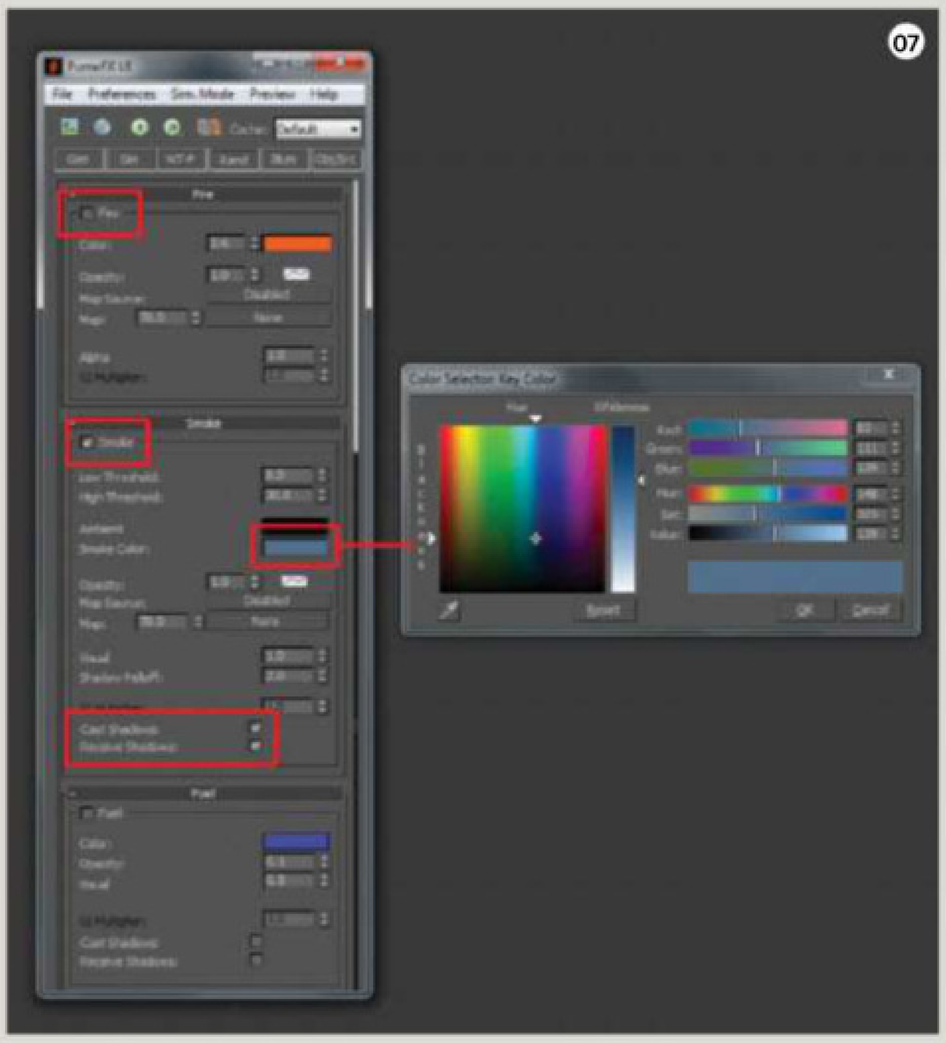
Before moving forward to the next steps, we need to place the lights. We are going to use two lights. One is Omni and the other is Target Spot. For Omni, set the position as X:-530, Y:-390, Z:158. Turn on shadows, then go to Shadow Parameters tab and turn on the atmosphere shadows with Multiplier set to 0.4 and Color set to R:220, G:255, B:255. Keep everything else as default. For the Target Spot light, set the light position to X:180, Y:550, Z:50 and Target position to X:0, Y:-10, Z:45. Like before, turn on the Shadows and go to the Shadow Parameters tab to turn on the Atmosphere Shadows, with a Multiplier set to 2.5 and Color set to R:255, G:191 and B:91. Again, keep everything else at the default setting. Now go ahead and add these lights to the FumeFX Illumination tab.

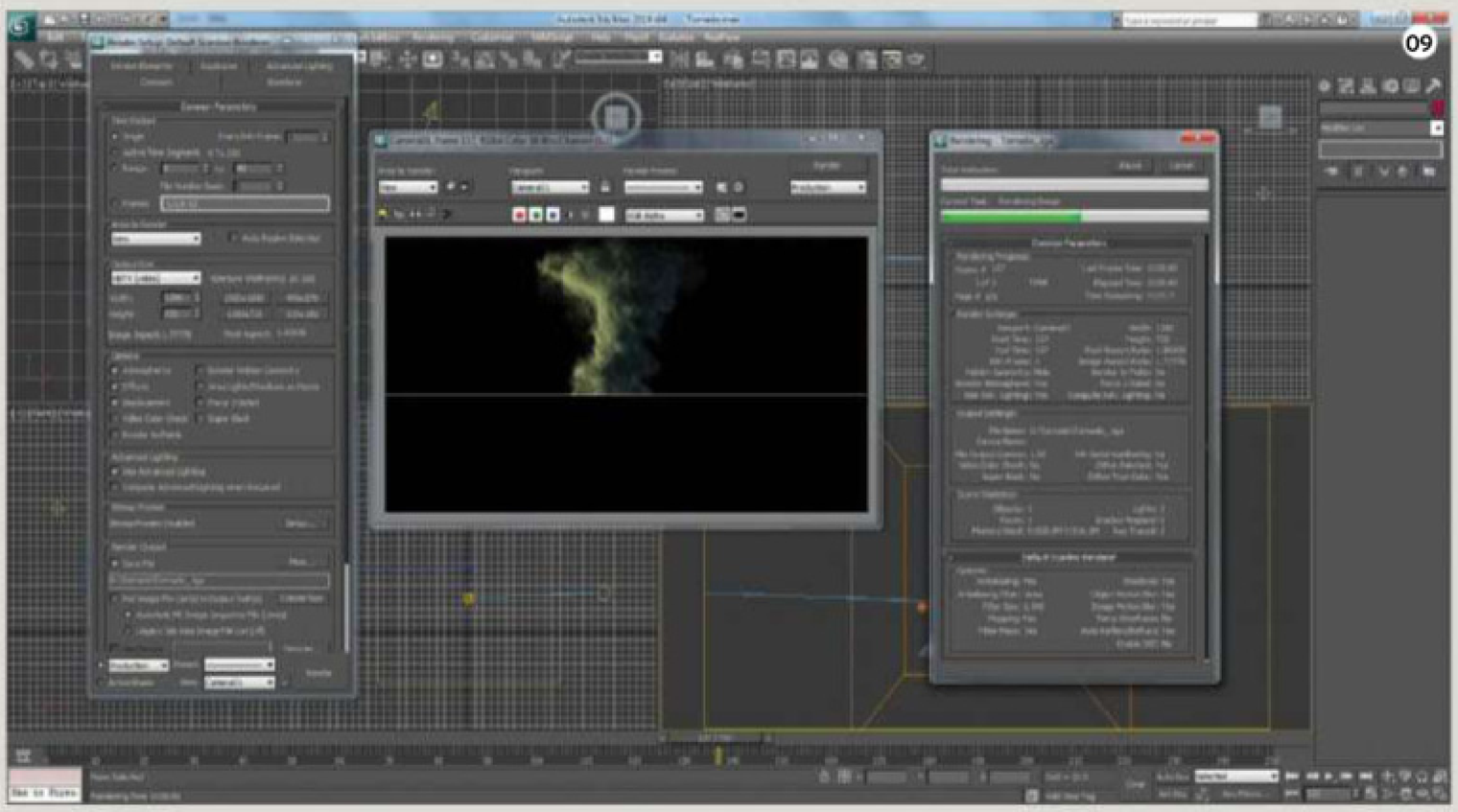
## 09 Rendering

For the final rendering of smoke, we will use the Default Scanline Renderer, as we are not going to apply Global Illumination, Light Scattering or Light. To render the smoke element, press F10 and the Render Setup window will appear. Set the Frame Range and Output Resolution as per your requirements. Now save the Render Output Path and hit the Render button. Wait a little while and after some time, we'll get our smoke element.

## 10 Post process with After Effects

We can now composite the smoke element. Load this layer in to the Timeline and assign some effects to it. Let's start with Color Balance. Navigate to Effects> Color Correction> Color Balance. Now set the Shadows to R:-19, G:5, B:46. Set MidTones to R:32, G:16, B:1 and Highlights to R:43, G:-18, B:-9. Once again go back to Color Correction and select Brightness and Contrast, set the Brightness to 13.0 and Contrast to 0.0. After this go to Effects> Blur and Sharpen. Select Sharpen, set it 50. You can use your own effects or parameters to give it a more realistic look.

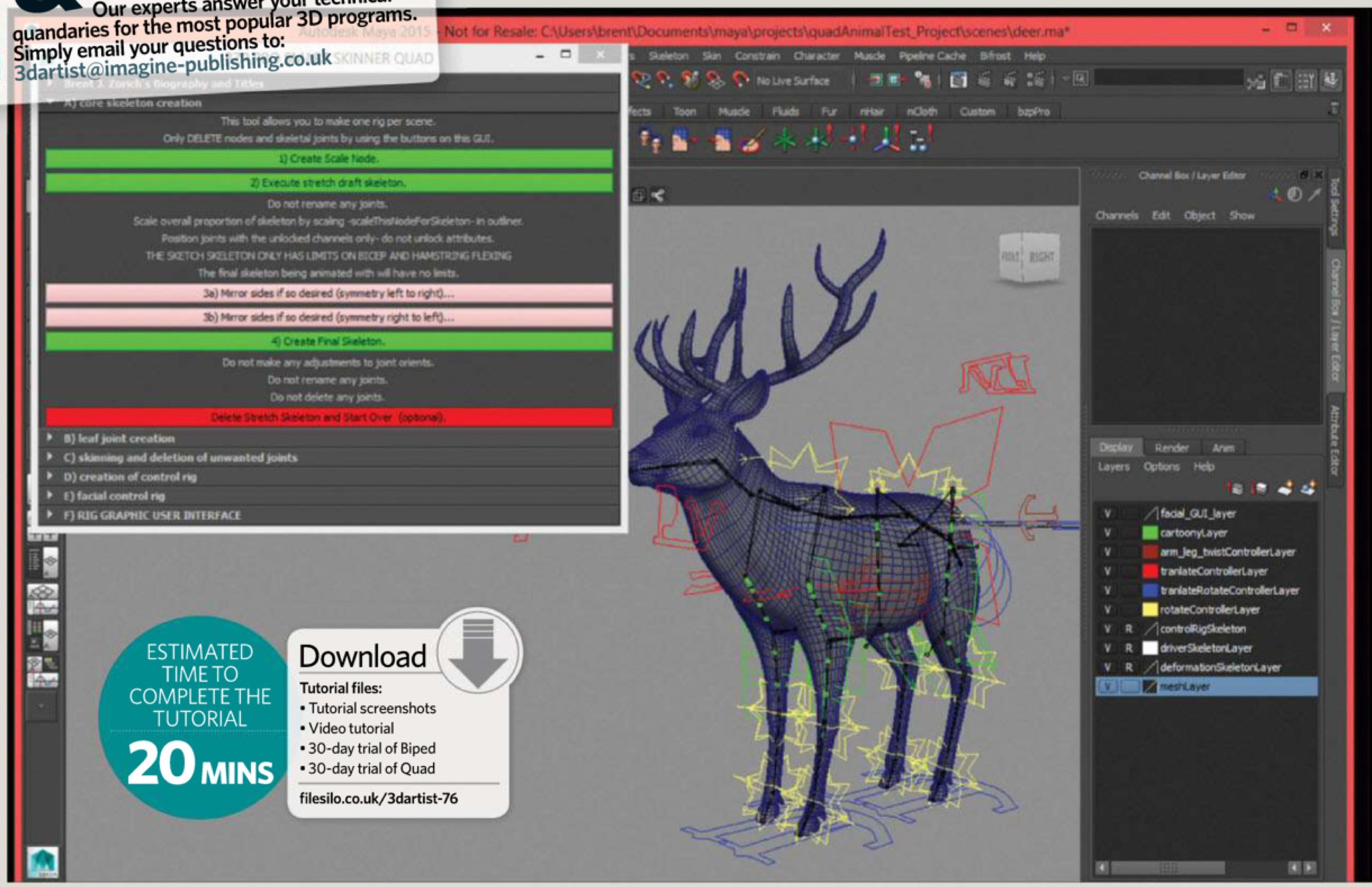




• **DID YOU KNOW?** • All tutorial files can be downloaded from: filesilo.co.uk/3dartist-76

# 3DArtist Questions & answers

Our experts answer your technical quandaries for the most popular 3D programs. Simply email your questions to: 3dartist@imagine-publishing.co.uk


Autodesk Maya 2015 - Not for Resale: C:\Users\brent\Documents\maya\projects\quadAnimalTest_Project\scenes\deer.ma*
SKINNER QUAD
Brent J. Zovich's Biography and Titles
A) core skeleton creation
This tool allows you to make one rig per scene.
Only DELETE nodes and skeletal joints by using the buttons on this GUI.
1) Create Scale Node.
2) Execute stretch draft skeleton.
Do not rename any joints.
Scale overall proportion of skeleton by scaling -scaleThatNodeForSkeleton- in outliner.
Position joints with the unlocked channels only- do not unlock attributes.
THE SKETCH SKELETON ONLY HAS LIMITS ON BICEP AND HAMSTRING FLEXING
The final skeleton being animated with will have no limits.
3a) Mirror sides if so desired (symmetry left to right)...
3b) Mirror sides if so desired (symmetry right to left)...
4) Create Final Skeleton.
Do not make any adjustments to joint orients.
Do not rename any joints.
Do not delete any joints.
Delete Stretch Skeleton and Start Over (optional).
B) leaf joint creation
C) skinning and deletion of unwanted joints
D) creation of control rig
E) facial control rig
F) RIG GRAPHIC USER INTERFACE
Channel Box / Layer Editor
Channels Edit Object Show
Display Render Anim
Layers Options Help
facial_GUI_layer
cartoonyLayer
arm_leg_twistControllerLayer
tranlateControllerLayer
tranlateRotateControllerLayer
rotateControllerLayer
controlRigSkeleton
driverSkeletonLayer
deformationSkeletonLayer
meshLayer

ESTIMATED TIME TO COMPLETE THE TUTORIAL **20 MINS**

## Download

**Tutorial files:**

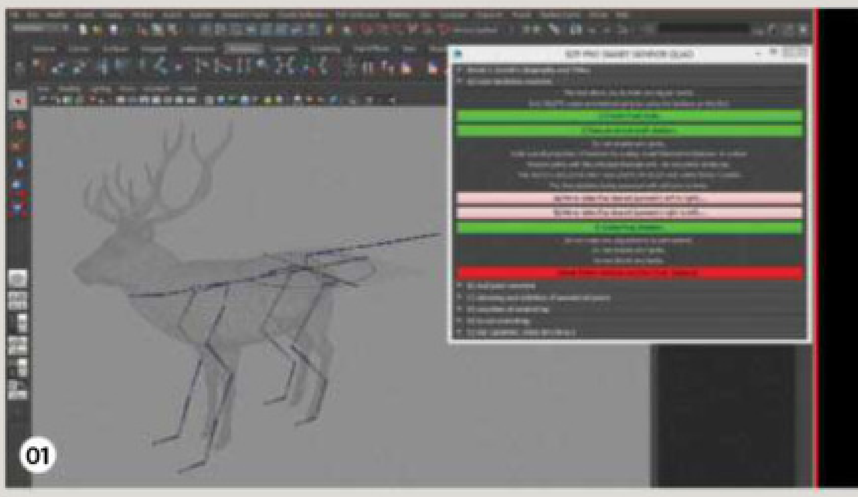
- Tutorial screenshots
- Video tutorial
- 30-day trial of Biped
- 30-day trial of Quad

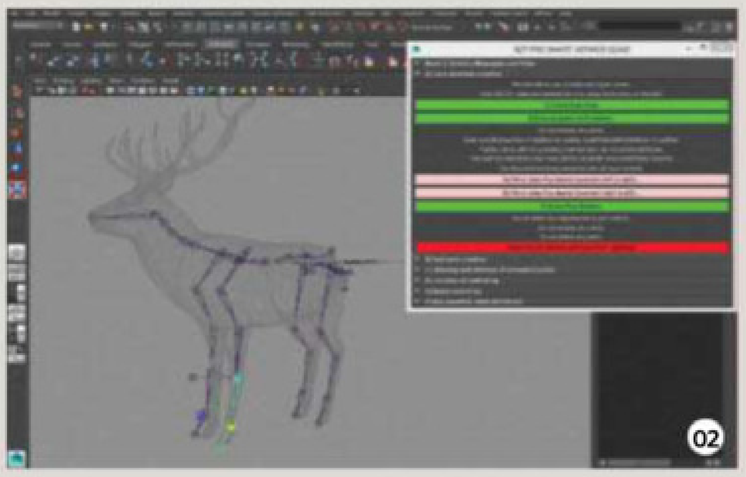
filesilo.co.uk/3dartist-76

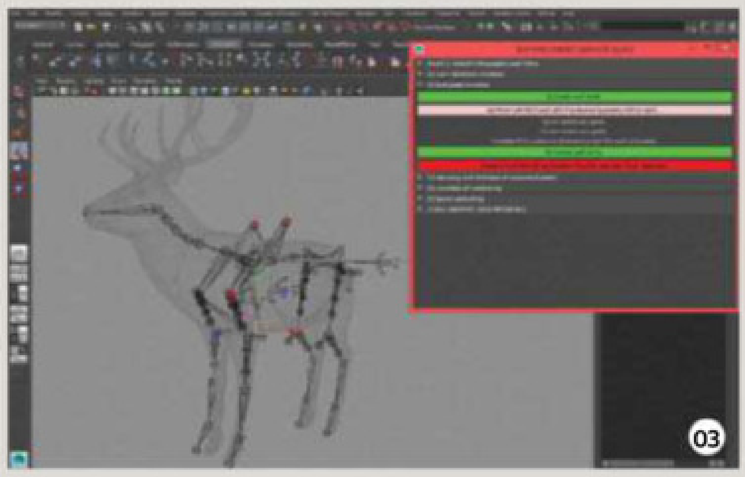
# Auto rigging with Smart Skinner

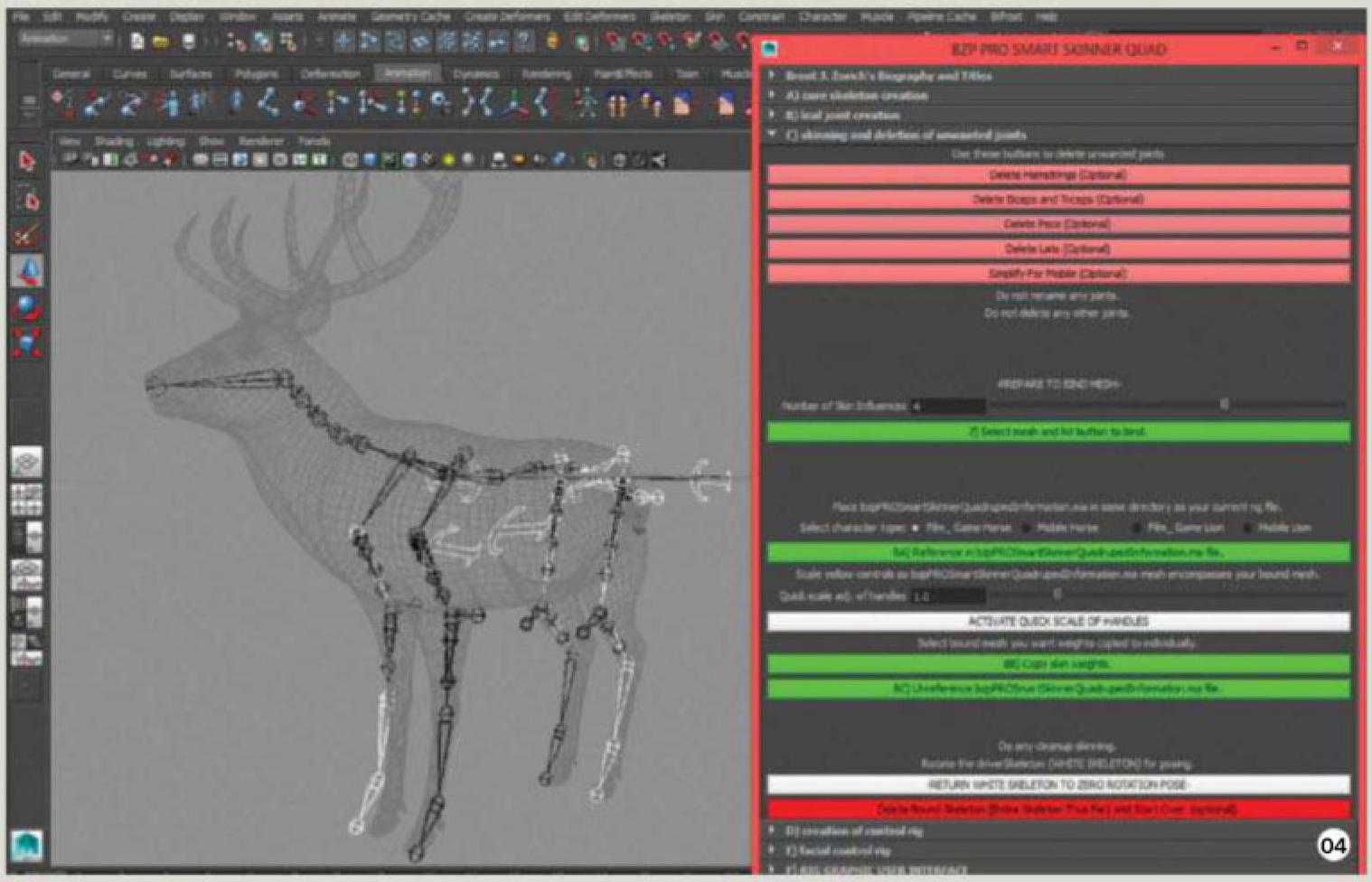
"How can I rig and skin a character more efficiently to save billable hours - typically days or weeks?"

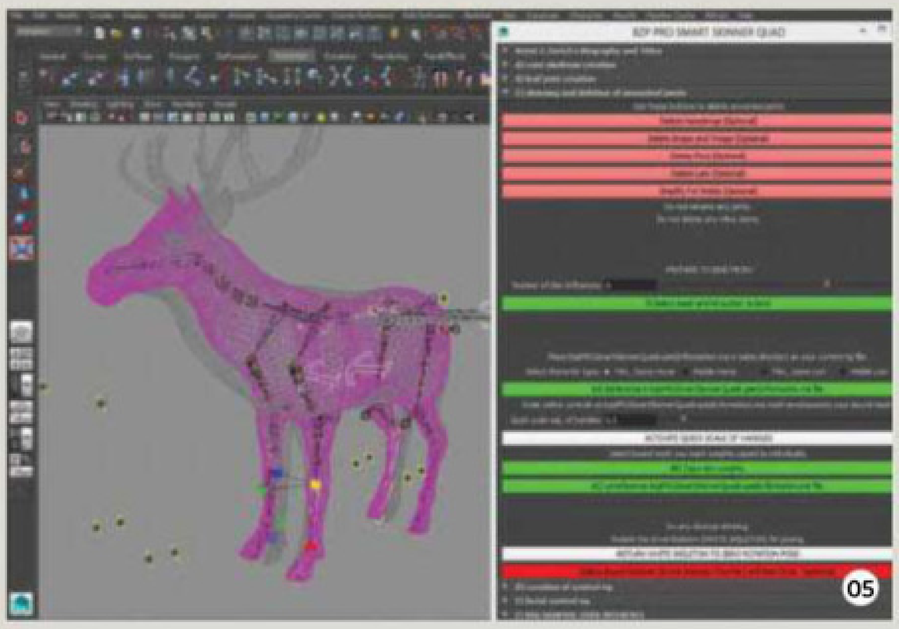
**This tutorial is a breakdown of how the Smart Skinner is used in the production environment to save days, if not weeks, on the rigging and skinning process of a character.** This step-by-step process goes over the basics of the software and will rig and skin a character of a deer in a matter of minutes. When I worked in production for the biggest companies on the planet, it would not be uncommon that from a billable standpoint, a development director might give me two weeks to start, execute, and complete a rigged character. This caused headaches in the production setting as often I was repeating the same task on different proportions without an effective way of cutting down hours. At Lucasfilm, I was looking through the assets of the main characters such as Ahsoka, Jango Fett and General Grievous extracting their key attributes and incorporating them into a super rig that could be benchmarked for the company. At EA Sports in the late 2000s I designed the rigging system used for Central Football for titles such as *Madden NFL* and *NCAA*. This Smart Skinner software I have written is a culmination of techniques from these top companies incorporated into a tool that is affordable and easy to use. The character will be completed through a process of firstly executing a sketch skeleton to obtain proper proportion. Then, the character will be blocked out within the mesh to ensure the joint positions are in the correct spot. The Smart Skinner will create the leaf helper twist joints to assist with the proper deformation required to make the rig production quality. Then, the animator specifies whether or not he wants the character to be a 'film next-gen character' or a 'mobile character'. From there he will reference in a pipeline that enables auto skinning, transferring the skinning weights, unreference the pipeline skinning file, and making an entire control rig at the push of a button. The end result will deliver a character able to be animated out of the box that is top-of-the-line production quality ready for either film or game.

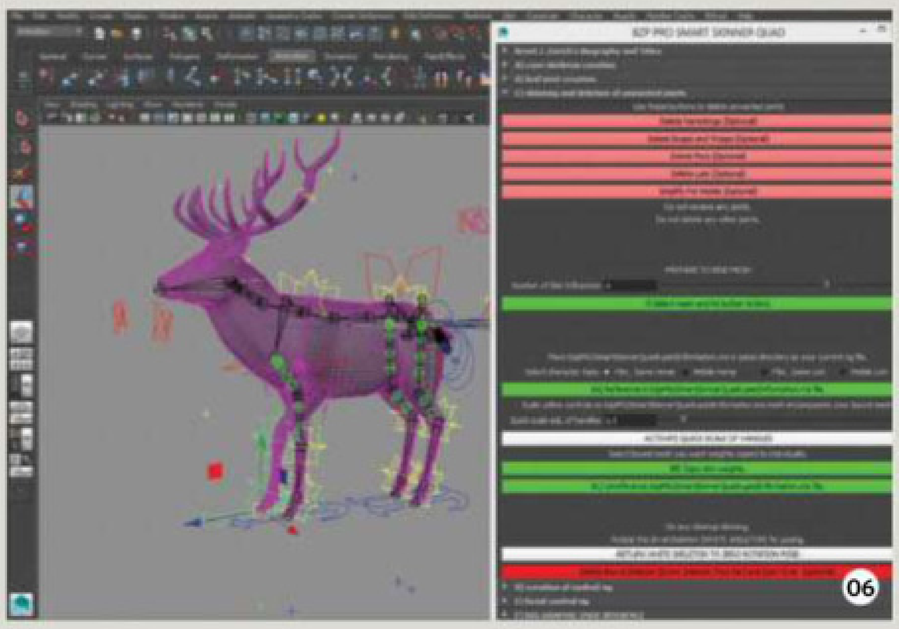




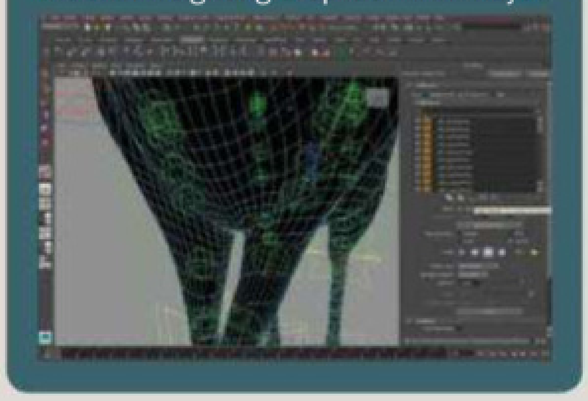




## Skinning cleanup on the character

In certain intersections of the character, there will be a need to do skinning cleanup on the joints. The skinner can't predict every deformation. This can be achieved by using the Hammer tool in the skin weighting drop-down in Maya.



### 01 Execute Scale Node and sketch skeleton

Push the button to activate the Scale Node. This will set the overall scale of the rig. Then hit button 2 to generate the sketch skeleton that is already in a base proportion. The animator needs to translate the root of their mesh to the 0 0 0 world space coordinate. The root of the sketch skeleton is locked.

### 02 Block out proportions of the skeleton

By using the open channels, and open channels only, begin to sketch out the proper proportion of the skeleton to the character. Locked are not to be unlocked, this will maintain the proper joint orientation and guarantee that your IK will be set up properly in Step 6. You can also mirror your skeleton for symmetry. Once you have the proportion you want, hit button 4 to lock the sketch skeleton into place. That will zero out your joints in your sketch skeleton.

### 03 Create leaf joints for deformation and counter rotation

Hit button 5 to execute the 'leaf helper' joints. These joints will assist in the counter rotation down the limbs for proper deformation. The animator can use the white anchor controls to assist in the orientation of the joints. Translate the red crosshairs to the proper position, if desired, to orient the pecs and lats on your character.

### 04 Delete unwanted joints or simplify for mobile gaming

Use the pink buttons to delete unwanted joints. It might be possible that you do not require pecs, lats, hamstrings, or biceps – use these buttons only to delete the joints and simplify down to 'mobile' if necessary.

### 05 Reference in skinning pipeline and transfer weights

Select whether or not you have a 'mobile character' or a 'film next-gen character" (note for the quad you will pick whether your character is built like a cat or a horse) and hit button 8A to reference in the pipeline file. Scale the yellow controls so the reference mesh encompasses the character mesh. Hit 8B to transfer the skin weights. Your skinning should be near completed. Hit 8C to unreference the reference file. You now have a clean scene with weighting that is 90 to 95 per cent complete. Do any cleanup skinning at this point.

### 06 Create control rig and facial GUI

Now that you have a skinned file, hit button 9 to generate the entire control rig. Your rig is complete. The rigging process is a three-joint chain rig: a control rig driving an animation skeleton that drives a deformation skeleton. In regards to complexity, the control rig is at the level of a major motion picture studio. Hit button 10 to generate your facial GUI that can be used with blendShapes in Maya. Once you've done this, you're ready to animate!

• **DID YOU KNOW?** • All tutorial files can be downloaded from: **filesilo.co.uk/3dartist-76**

# 3DArtist SPECIAL SUBSCRIPTION OFFER

# SUBSCRIBE TO 3DArtist AND SAVE 40%

ANIMATE FIGHT MOVES
5GB OF FREE ASSETS EQUIVALENT TO 8 DISCS
3DArtist
76
Practical inspiration for the 3D com
CREATE ZBRUSH HAIR IN 17 STEPS
Explore an artistic real-time workflow
3DS MAX MASTERCLASS
Perfect characters • Refine your technique
Achieve incredible results
NUKE STUDIO PAGE 80
Maya rigging
Set up your characters easily and efficiently using Smart Skinner
ACHIEVE BETTER LIGHTING
The experts come together to bring you 24 ways to improve
PLUS
V-Ray 3.0 for Maya
Substance Painter 1.0
Win a copy of iClone 6
Simulate a tornado
Model an FPS weapon
Generate pro game assets
8 DISCS' WORTH OF CONTENT
• MODELS WORTH $150
• 20% OFF UNWRELLA FOR 3DS MAX AND MAYA
• 25 3DTOTAL TEXTURES
• 3 PANORAMIC HDRIS
Sculpt a sci-fi soldier
Learn all you need to know about the ZBrush to Photoshop pipeline with our step-by-step guide
ISSUE 76
£6.00

**PAY ONLY £10.80 EVERY 3 ISSUES**

INCREDIBLE STEP-BY-STEP TUTORIALS

EXCITING, INDUSTRY-LED FEATURES

## ORDER HOTLINE
**0844 249 0472**

## ONLINE AT
**www.imaginesubs.co.uk/3da**

# EVERY ISSUE PACKED WITH...

- **Exclusively commissioned art**
- Behind-the-scenes guides to images and fantastic artwork
- **Digital downloads of amazing assets**
- Interviews with inspirational artists
- **Tips for studying 3D or getting work in the industry**
- The chance to see your art in the mag!

# WHY YOU SHOULD SUBSCRIBE...

- **Save 40%** off the cover price – **just £10.80 every 3 issues** on Direct Debit
- **FREE delivery** direct to your door
- **Never miss an issue**

# ORDER BY

28 FEBRUARY 2015

Use code **PQ15** for this offer

## BY POST

Send your completed form to:
3D Artist Subscriptions, 800 Guillat Avenue,
Kent Science Park, Sittingbourne, Kent ME9 8GU

## YOUR DETAILS

Title_____ First name_____

Surname_____

Address_____

_____

_____

Postcode_____ Country_____

Telephone number_____

Mobile number_____

Email address_____

## DIRECT DEBIT PAYMENT

☐ **UK Direct Debit Payment**

I will pay just £10.80 every 3 issues

**Instruction to your Bank or Building Society to pay by Direct Debit**

DIRECT Debit

IMAGINE PUBLISHING

Please fill in the form and send it to: Imagine Publishing Limited, 800 Guillat Avenue, Kent Science Park, Sittingbourne, Kent, ME9 8GU

Name and full postal address of your Bank or Building Society

To: The Manager — Bank/Building Society

Address

Postcode

Name(s) of account holder(s)

Branch sort code

Bank/Building Society account number

Originator's Identification Number: 5 0 1 8 8 4

Reference Number

Instructions to your Bank or Building Society
Please pay Imagine Publishing Limited Direct Debits from the account detailed in this instruction subject to the safeguards assured by the Direct Debit guarantee. I understand that this instruction may remain with Imagine Publishing Limited and, if so, details will be passed on electronically to my Bank/Building Society

Signature(s)

Date

Banks and Building Societies may not accept Direct Debit instructions for some types of account

A6 instruction form

## PAYMENT DETAILS

**YOUR EXCLUSIVE READER PRICE, 1 YEAR (13 ISSUES)**

☐ **UK £62.40 (Save 20%)** ☐ **Europe – £70.00**

☐ **World – £80.00** ☐ **USA – £80.00**

**Cheque**

☐ I enclose a cheque for £_____

(made payable to Imagine Publishing Ltd)

**Credit/Debit Card**

☐ Visa ☐ Mastercard ☐ Amex ☐ Maestro

Card number

Expiry date

Issue number ☐☐ (if Maestro)

Signed _____

Date _____

Please tick if you do not wish to receive any promotional material from Imagine Publishing Ltd by post ☐ by telephone ☐ via email ☐

Please tick if you do not wish to receive any promotional material from other companies by post ☐ by telephone ☐ Please tick if you DO wish to receive such information via email ☐

**TERMS & CONDITIONS**

This offer entitles new UK direct debit subscribers to pay only £10.80 every 3 issues. New subscriptions will start from the next available issue. Offer code PQ15 must be quoted to receive this special subscription price. Details of the Direct Debit guarantee are available on request. This offer expires 28 February 2015 . Imagine Publishing reserves the right to limit this type of offer to one per household. Subscribers can cancel this subscription at any time.

Last-minute client revisions, such as adding graffiti to the side of a building and grading is an easy task in NUKE Studio

# NUKE Studio

## Newly released NUKE Studio unifies NUKEX and HIERO as a suite, offering multiple phases of post within a single application

**REVIEW BY Paul Champion,** 3D and VFX demonstrator, NCCA, UK

**For several years, HIERO – The Foundry's shot management, conform and review and timeline application for VFX – has been the pipeline complement to node-based compositor NUKE.**

The release of NUKE Studio marks the next step in both applications' relationship by bridging the existing NUKE–HIERO workflow and melding the two toolsets into one product. If you're already familiar with the applications individually, you'll take to the suite like a duck to water.

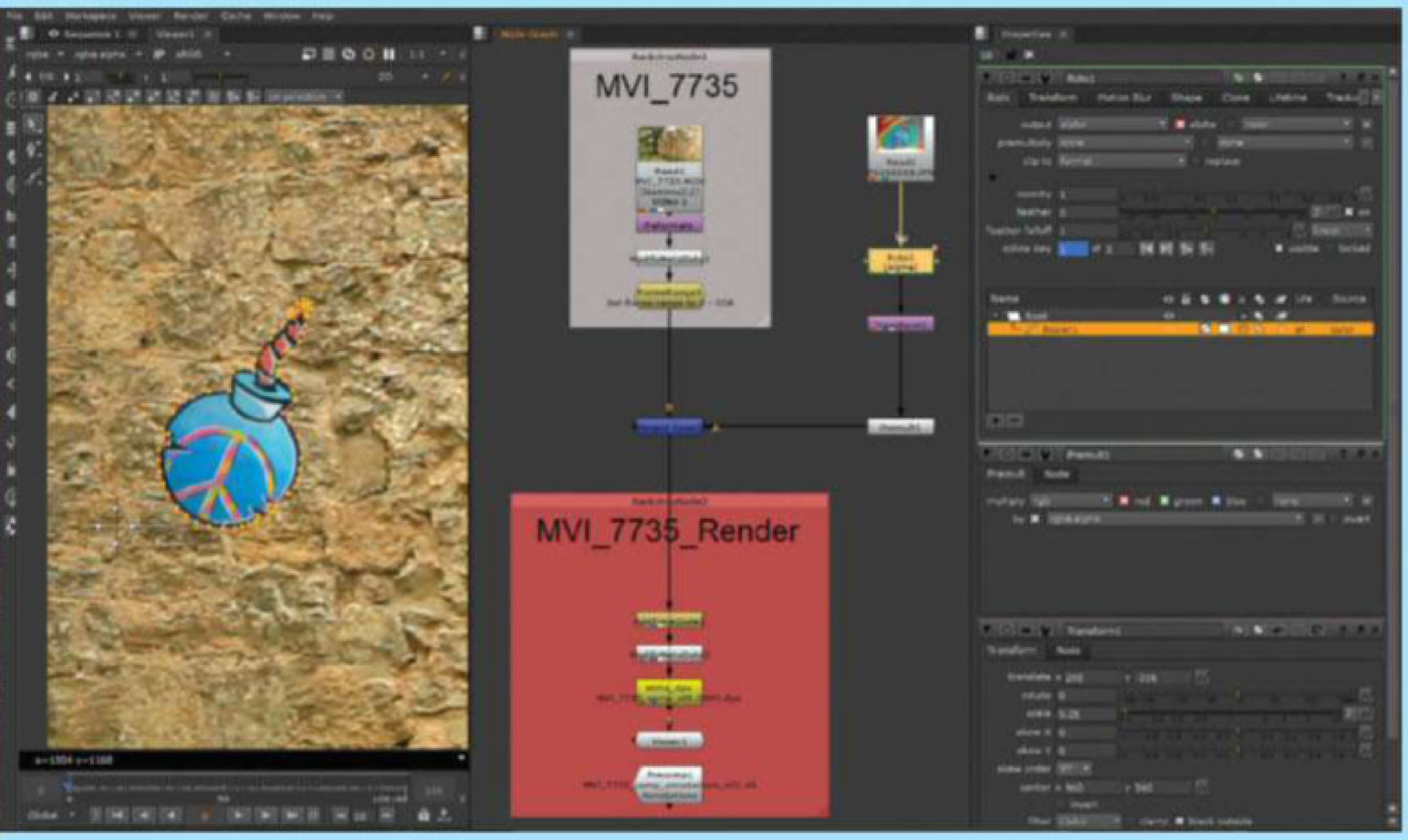
On loading NUKE Studio, you're greeted by a user interface which looks very similar to HIERO. To encompass both applications, the Foundry has used workspaces; namely Conforming, Editing, Reviewing, Timeline finishing and Compositing, which allows easy navigation to and fro, depending on where you want to work.

The Conforming workspace, as with HIERO, lets you import and view EDL (Edit Decision List) and XML files, but unlike HIERO the AFF (Avid) format is now also supported. The Editorial workspace provides similar functionality to what's found in HIERO, such as gestural mouse control, inserts, three-point editing with the source and record viewers, plus an editorial toolkit with standard tools like razor, retime, ripple and so forth. The Reviewing, Timeline and Finishing workspaces similarly offer the HIERO options you're likely to need. Finally, the Compositing workspace grants direct access to the full NUKEX environment, which is a workflow improvement on having to launch instances of NUKE via HIERO.

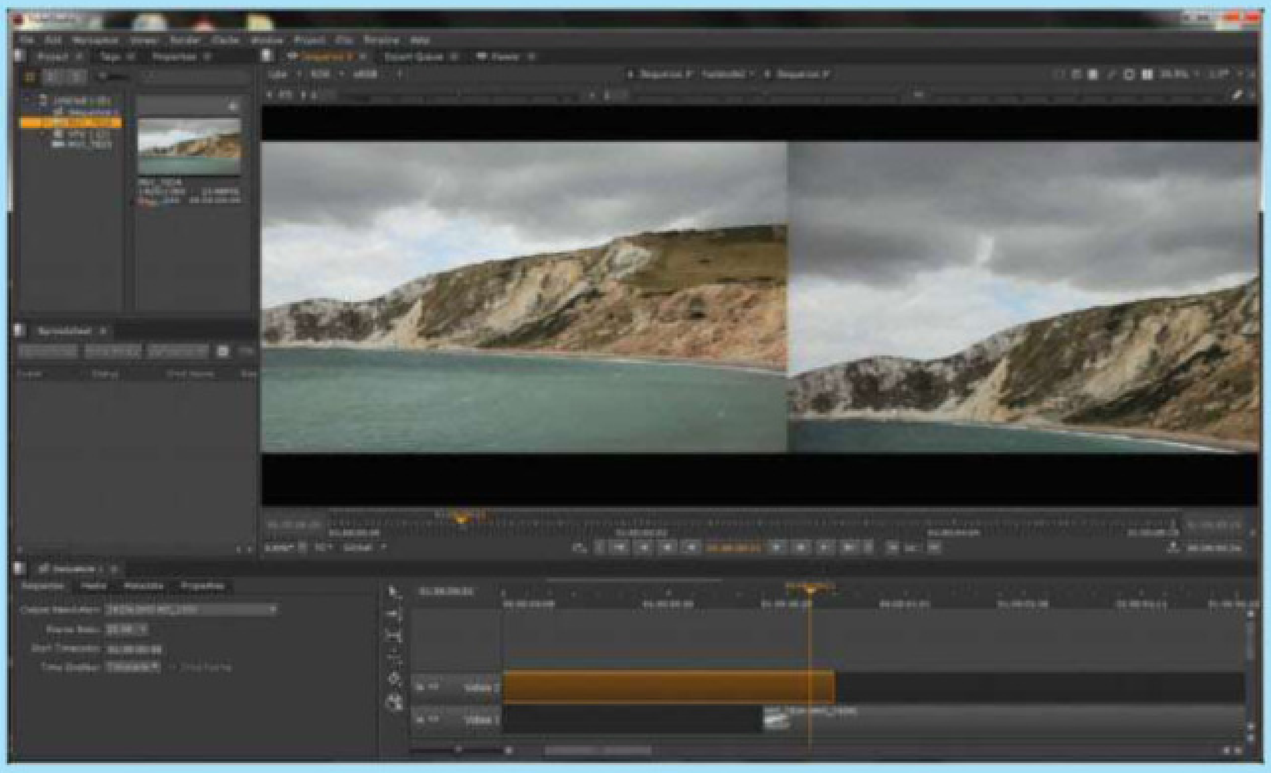
With the integration come some useful new options such as Soft Effects, which are a selection of NUKE nodes that can be applied to clips in the Timeline, offering a faster alternative than resending back to comp which is frustrating for minor changes. The Soft Effects enable stackable adjustments such as Grade, Retiming, Cloning and Colour Transforms using CDLs and LUTs in real-time on the GPU. They can be allied across all shots too as well as individually.

Sending a clip to the NUKEX environment is as simple as right-clicking a clip in the Timeline and choosing to create a comp, then double-clicking the clip to enter NUKEX and start comping. Versioning lets you create multiple different comps, which are useful if you're trying things out or for quickly showing clients the various options you've been working on. While testing this software I found the ability to work in this fashion very unrestrictive, especially since it's painless and easy to go back and forwards with changes.

The Foundry has also placed a strong emphasis on NUKE Studio being used to work



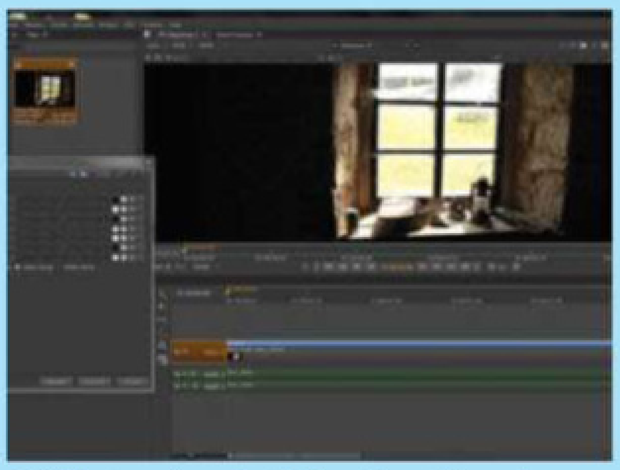

The integration of NUKEX makes jumping into and out of comps to update shots very quick



With a Workspace dedicated to Conforming, you can problem solve inside the software

collaboratively. Artists can leave annotations by making notes in the Timeline, comps can then be shared as well as the annotations with a NUKE team who can then revise accordingly and then bring it back to NUKE Studio. This functionality can also serve for review sessions, which is ideal for VFX supervisors. Playback is in real-time at the current industry standard of 4K either in the Suite or SDI-Out Hardware. Artists can also share Python scripts for automation and customisation. A ready-to-use, built-in render farm is also bundled in and extra machines can be added for speed boosts.

NUKE Studio's audio controls have been enhanced, giving per track and overall volume controls. Audio output for track items can also be toggled between left, right, and mono using the audio toggles in the track header. NUKEX has the AudioRead node for bringing in audio files, which can be viewed in the



**Soft Effects such as Grade, Transform, Mirror, Crop, Timewarp are accessible on the Timeline, in real-time running on the GPU**

Curve Editor and Dope Sheet in order to line up keyframes of your composition with the waveform of the sound. You can then flipbook the audio with your footage to preview your comp with sound. However, that said, the audio tools would perhaps benefit from a little further development.

## Essential info

**Price: £5,600 / $8,761 US***

**www.thefoundry.co.uk/products/nuke/studio**

There are other payment options – full list at www.thefoundry.co.uk/products/NUKE/pricing

### OPERATING SYSTEMS

- Mac OS X version 10.8 (Mountain Lion), 10.9 (Mavericks)
- Windows 7 64-bit and Windows 8 64-bit
- CentOS/RHEL 5 and CentOS/RHEL 6

### OPTIMAL SYSTEM REQUIREMENTS

- x86-64 processor, such as Intel Core 2 Duo or later
- 5GB disk space available for caching and temporary files
- At least 8GB RAM
- Display with at least 1,280 x 1,024 pixel resolution and 24-bit colour
- Graphics card with at least 512MB of video memory and driver support for OpenGL 2.0. Tested Graphics Cards for Linux are Quadro K4000 and Quadro K6000
- To enable optional GPU acceleration of Viewer processing, you need OpenGL 2.0 with support for floating point textures and GLSL

NUKE Studio has HIERO functionality, and can be used for final finishing and export

## The good & the bad

- ✓ Collaborative workflow
- ✓ Real-time 4K playback
- ✓ Soft Effects
- ✓ Integrated Renderfarm capability
- ✓ Python API
- ✗ Would benefit from extra Audio Tools

## Our verdict

| | |
|---|---|
| Features | 8/10 |
| Ease of use | 9/10 |
| Quality of results | 10/10 |
| Value for money | 10/10 |

"An alternative to established top-tier products such as Autodesk's Flame, at an attractive price"

**Final Score 9/10**

*Price conversion correct at time of printing

The physically-based rendering shader in Substance Painter helps games artists better envisage how their asset will look in-game

# Substance Painter

## Dubbed 'the new generation of texture painting', Substance Painter has debuted and it's truly a killer app for videogames artists

**REVIEW BY Paul Champion,** freelance writer and 3D demonstrator

**Now is a great time to be a texture artist, as over the last few years several applications have been developed to combat traditionally painstaking workflows.** Substance Painter is just the latest to join the ranks. Built on the Substance Engine, it's primarily a 3D layer-based painting and procedural texturing application aimed at videogames artists.

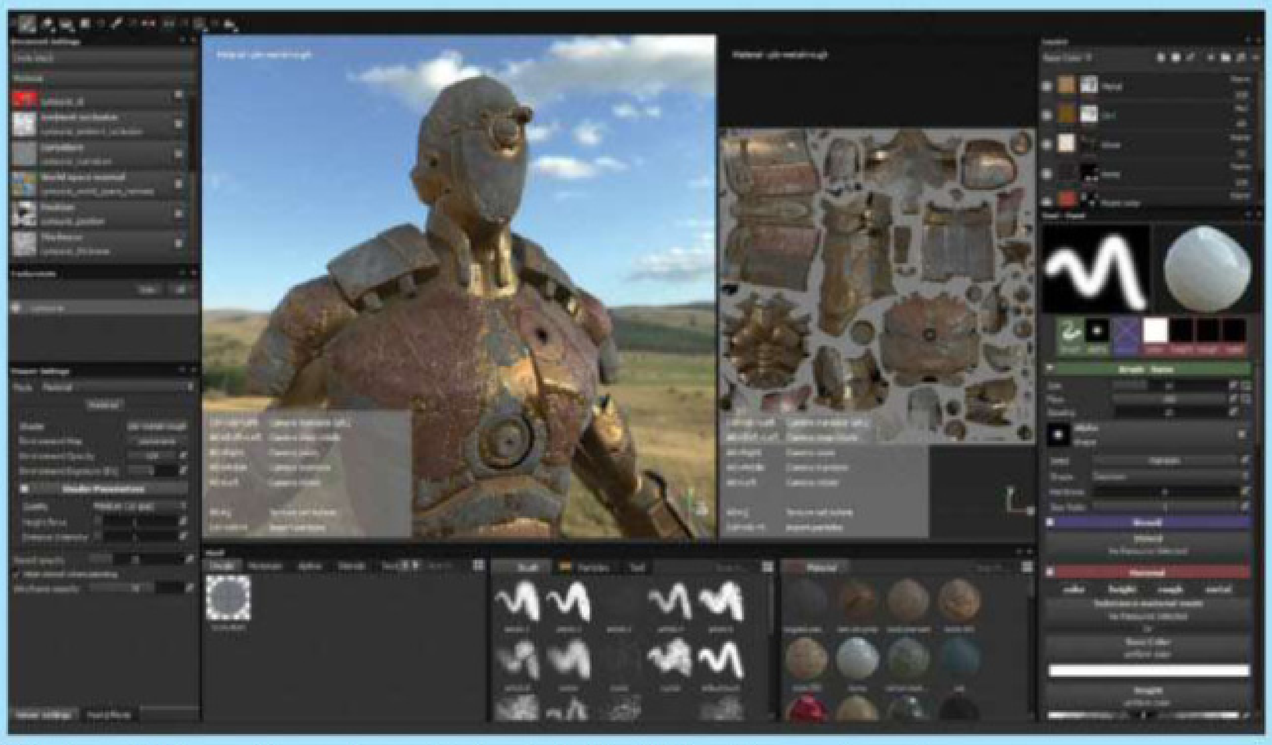
Getting started in the app is simple. First select your mesh – a large variety of file formats are supported – then choose the Normal Maps type: OpenGL or DirectX. You can select the resolution to a maximum of 4,000, and finally pick additional Normal and Baked maps. Substance Painter runs non-destructively, retaining a history as you work and only rasterising when exporting.

The interface is organised so you'll rarely need to hunt for hidden or less-frequently used tools. There's ample room to display each panel, which can be undocked or closed if you need extra space to work. The Shelf panel contains thumbnail images for at-a-glance selection of the various painting resources and is divided neatly into categories by tabs. I used an Apache AH-64 model for testing, which needed some preparation in Maya so I could paint its interior. I gave the chassis, cockpit glass and interior different materials and created UVs. Substance Painter recognises each Material ID and assigns TextureSets, which can then be independently viewed and painted. For the glass, I had to settle for something opaque, as the app doesn't currently have a method for viewing transparency.

The 2D View displays the selected TextureSets UV map – I rather lazily used Maya Automatic Mapping for the Apache, as Substance Painter by default supports the option of painting in 2D across seams, which saved me the trouble of manually unwrapping. It's also possible to automatically reproject UVs or topology to change the UV layout completely, so you can always go back if you encounter a problem. If you import an updated mesh, Substance Painter recalculates the strokes to match the new layout. This is rather different to other solutions, in that Substance Painter retains all the history and layers – the layer stack is not merged in the same way as in 3D Coat and MARI.

The 3D View uses a PBR (physically-based rendering) shader, which is designed to help artists see exactly how it will look in-game. Custom shaders are also supported and production teams can import these to match the game engine and work with any custom channels. After choosing a brush and Alpha, Surface Painter enables you to paint in Normal or Particle mode on one or multiple

A non-photorealistic Toon shader is provided, but you can also import your own custom shaders as well and make your own Channels to paint on

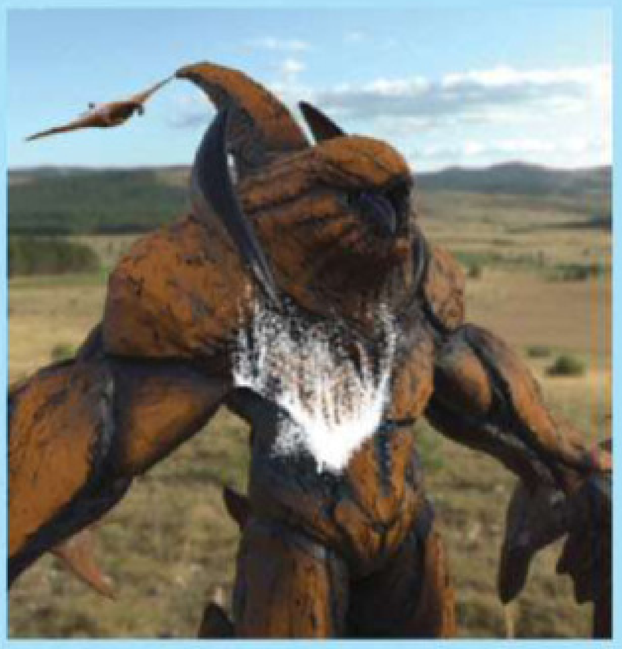


Substance Painter enables you to seamlessly paint in the 2D View. You can choose to paint on UV, Tangent or according to the Camera view

channels – namely Base Color, Height, Roughness and Metallic in either 2D or 3D View. Stencil masks are also supported, which are useful for painting decals and logos.

Painting Height maps using positive and negative values and lets you sculpt detail into the mesh. When it comes to exporting, the map produced is a combination of the Normal map imported for the mesh, along with the Height map data. Intensity can further be controlled globally with the Height Force setting in the Viewer Settings. You can also export the Height map itself for use with parallax mapping, as well as Displacement.

Particle mode painting is by far my favourite tool and a really great idea – the numerous Physics settings and choice of Emitters and Receivers enables you to work in an almost Jackson Pollock style. You can throw paint with real physics onto the mesh to produce organic details such as decay, dirt and stains in a fraction of the time it would take by hand. Those happy moments where something you hadn't planned but really like also make the Particle Brushes a joy to use.



**For each particle effect you can change the sliders to create a new effect or modify the current settings**

## Essential info

**Price: Pro licence US $ 590 (approx £376)**
**Indie licence US $ 149 (approx £95)**

**www.allegorithmic.com/products/substance-painter**

**OPERATING SYSTEMS**

- Windows 7 (64-bit) / Windows 8 (64-bit)
- Mac OSX 10.8 and higher

**OPTIMAL SYSTEM REQUIREMENTS**

- RAM: 2GB minimum – 4GB recommended
- GPU: DX9 – DX10 – DX11 – Shader Model 3.0
- Video Memory: 512MB minimum – 3GB recommended

The TextureSets pane shows all the Material IDs of your assets. You can opt to view individual TextureSets using the Solo mode

## The good & the bad

- ✓ Non-destructive
- ✓ Material painting and PBR
- ✓ Substance effects
- ✓ Particle painting
- ✗ No rendering method
- ✗ Only supports up to 4K resolution
- ✗ Multiple UV tiles aren't currently supported
- ✗ Subsurface scattering effect is unavailable

## Our verdict

| | |
|---|---|
| Features | 8/10 |
| Ease of use | 9/10 |
| Quality of results | 9/10 |
| Value for money | 9/10 |

"For a Version 1 release, Substance Painter is off to a great start and is definitely worth a look"

**Final Score 9/10**

# Dell T5810

## A mid-range workstation that packs a punch

**REVIEW BY Orestis Bastounis,** technology writer, UK

**The tail end of 2014 has seen plenty of new technology, with processor and graphics card refreshes at every end of the market.** The Precision T5810 makes the most of these new components to deliver significantly better 3D performance than the somewhat disappointing T5610 we reviewed earlier this year.

In terms of appearance, it's hard to discern any visible difference between the two. Not that it's a bad thing. The T5810 employs the same nifty, slimline desktop case that can be used in either horizontal or vertical orientation. With its silver handles and funky mesh grill, it's highly functional and attractive in a prim and proper, corporate way. However, there are plenty of improvements on the inside.

It starts with a more up-to-date processor; a 3.5GHz quad-core Intel Xeon E5-1620 v3, with 10MB of cache – a better fit for 3D work than the previous choice. Then there's one of AMD's new mid-range FirePro W5100 cards, which launched only recently, as part of a top-down redesign of the company's professional GPU line-up.

Storage is catered for by a 1TB WD Blue hard disk, with Windows 7 as standard and 16GB of non-ECC DDR3 memory.

The W5100 graphics card is a mixed bag. It sees a similar doubling in VRAM capacity that AMD has bestowed upon all its cards, to 4GB. The core is based on AMD's Bonaire design, carrying 768 stream processors and a 930MHz clock speed. Memory bandwidth is slightly down, however, over the W5000, and overall compute performance is up just 10 per cent, to 1.43 TFLOPs.

That said, this card still packs a strong punch when combined with the Xeon chip. A Cinebench 15 CPU score of 704 is over double that of the T5610, and overall graphics performance is up too. In 3ds Max, the T5810 took 4 minutes 45 seconds to complete the Underwater test; 2 minutes 13 seconds in the Studio Scene test.

These are mixed results, given that the T5810 costs over £1,600 (inc VAT), slightly pricey for a mid-range system. It particularly struggles when compared with the winner of our Battle Of The Brands group test from issue 73, Fujitsu's Celsius W530, which outperforms it by a wide margin across the board. That system may cost a bit more, but offers almost 50 per cent better 3D performance.

Dell has remained faithful to its typically corporate leanings when it comes to design. It's nice to see some real attention paid to rear ventilation on a workstation

Although it wouldn't be our first choice workstation for 3D applications, the T5810 still offers a fair amount in terms of performance

The power supply unit on the Dell T5810 is externally accessible, with options available for either a 425W unit or a more sturdy 685W

### Essential info

**Price: £1,358 ex VAT (£1,666 inc), US $2,126**

**www.dell.com/uk/business/p/precision-t5810-workstation/fs**

**OPERATING SYSTEMS**

- Windows 7

**TECHNICAL SPECIFICATIONS**

- 16GB DDR3 RAM
- AMD FirePro W5100 GPU
- Intel Xeon E5-1620 CPU at 3.5GHz
- 1TB HDD
- Intel C612 chipset

## The good & the bad

✓ Better CPU than before
✓ Good GPU performance
✓ Massive improvement over older Dell T5610 system

✗ Outperformed by other mid-range workstations
✗ Middling storage performance
✗ Poor value for money

### Our verdict

| | |
|---|---|
| Features | 7/10 |
| Performance | 7/10 |
| Design | 8/10 |
| Value for money | 5/10 |

"While it's not bad by any means, the Dell T5810 wouldn't be our first choice for a desktop workstation"

**Final Score 7/10**

With the inclusion of the new DDR4 in the WS-X180, the speed performance is excellent

# Workstation Specialists WS-X180

## Haswell-E, DDR4 memory and a Quadro K4200 offer lightning-fast performance

**REVIEW BY Orestis Bastounis,** technology writer, UK

**Arriving in a massive flight case that almost crippled our poor courier, you could be forgiven for thinking the WS-X180 contained some secret technology that only a select few were permitted to see.**

The reality isn't all that dramatic, but for 3D purposes it's even better, since the WS-X180 is the first workstation we've tested to make use of DDR4 memory and Intel's brand new Haswell-E Core i7-5960X Extreme Edition processor, an eight-core desktop chip. Coupled with the new X99 motherboard chipset, the Intel 5960X means you can now have eight CPU cores without the overhead of a Xeon processor – a huge benefit for 3D and multimedia production. This chip is a great performer in its own right, but it has also been overclocked to 4.2GHz by Workstation Specialists, thanks to the use of a Corsair H80 closed-loop water-cooling system. Alongside it is Nvidia's powerful Quadro K4200 graphics card with 8GB of on-board memory.

Workstation Specialists aimed to keep the price of its review hardware below £3,000, so the unit it sent us only had a 120GB Samsung 840 Evo SSD. This and the Quadro can be easily upgraded when buying – highly recommended in the case of the SSD.

It's housed in Workstation Specialists' custom ATX chassis, with the usual glowing red and white branding on the front. It's not much of a looker, being built like a tank, but such size is necessary to house the fans required to cool such powerful components and their considerable heat output. In addition to the overclocked eight-core CPU, the DDR4 memory runs at speeds up to twice that of DDR3, pushing performance further so we expected spectacular results – and that's just what we got. The WS-X180 is the third-fastest workstation we've ever tested, behind two systems that cost three times as much.

3ds Max, the most multithreaded of our tests, completed the 1080p Underwater scene in 7 minutes 14 seconds, beaten only by Scan's 3XS GW-HTX35 and HP's Z820. The extra CPU performance pushed the Quadro K4200 to new heights, with SPECviewperf results that snap at the heels of older workstations powered by K5200 cards. Cinebench 15 GPU results even managed to best it with a score over 200 points.

This shows that Intel's latest desktop chips have totally disrupted the workstation market. By sacrificing a few Xeon-only features like multiprocessor support and ECC memory, you can now get the performance approaching a £10,000 system out of one such as the WS-X180 that costs about a third.

Given the typically good after-sales support from Workstation Specialists and the solid, if not attractive, build quality, the WS-X180 is an essential consideration.

## Essential info

**Price: £2,995 ex VAT**
**£3,594 inc VAT / $4,689**

**www.workstationspecialist.com**

**OPERATING SYSTEMS**

- Windows 7

**TECHNICAL SPECIFICATIONS**

- Up to 64GB DDR3 RAM
- Nvidia Quadro K4200 GPU
- Haswell-E Core i7-5960X Extreme Edition
- 120GB SSD
- Corsair H80 water cooling system

Workstation Specialists' prominent logo sits proudly at the bottom of the huge, unsightly chassis

## The good & the bad

- ✓ Brilliant performance from Haswell-E CPU
- ✓ Fast and powerful GPU
- ✓ DDR4 memory accelerates performance
- ✓ Relatively affordable, given the hardware
- ✗ Enormous and heavy
- ✗ Custom chassis design starting to look a bit ugly compared with other designs

## Our verdict

| | |
|---|---|
| Features | 8/10 |
| Performance | 10/10 |
| Design | 8/10 |
| Value for money | 9/10 |

"A great system that brings down the cost of high-end performance"

**Final Score 9/10**

January Sale

# TRY SOMETHING NEW FOR JUST £1*

## BROADEN YOUR MIND

## EXPAND YOUR HORIZONS

**CHOOSE A TRIAL SUBSCRIPTION TO ANY ONE OF OUR INSPIRING AND INFORMATIVE MAGAZINES AND YOU'RE GUARANTEED TO LEARN SOMETHING NEW WITH EVERY ISSUE!**

**KNOWLEDGE & SCIENCE**

**TECHNOLOGY**

**VIDEOGAMES**

## 3 TRIAL ISSUES OF ANY MAGAZINE FOR JUST £1*

**ORDER ONLINE AT IMAGINESUBS.CO.UK/JAN151**

**OR CALL 0844 856 0644 (QUOTE JAN151)**

*This offer entitles new UK Direct Debit subscribers to receive their first three issues for £1. After these issues standard subscription pricing will apply. Subscribers can cancel this subscription at any time. New subscriptions will start from the next available issue. Offer code Jan151 must be quoted to receive this special subscription price. Details of the Direct Debit Guarantee are available on request. This offer expires 01/03/2015. Imagine Publishing reserves the right to restrict this type of offer to one per household.

# V-Ray 3.0 for Maya

## We couldn't wait to get stuck into some of the features found in the latest edition of the rendering software

**REVIEW BY Geoff Kirk-Smith,** Senior character animator at Assembly, New Zealand

**One of the most significant additions to V-Ray 3.0 is the rendering speed increase.** Even for scenes as relatively simple as our studio production example, it was still to great benefit as it let us iterate more often to get just the look we were striving for. For the most part we used Brute Force / Light Cache for our GI solution, and our renders were noticeably faster on this production even compared to the earlier, simpler one of the same product we created last year.

For scenes with many lights, the new probabilistic lighting control can make some big differences to render times. With scenes of around 100 lights, turning on probabilistic lights and asking it to sample 32 lights at a time, we saw over 20 per cent reductions in render time. Beware of setting the value too low, however: you'll introduce noise that takes longer to get rid of than the time you save in rendering.

The fact that V-Ray RT now renders in the native Maya Viewport is a fantastic addition, as we could accurately assess our lighting and shading while still being able to tumble and edit the scene interactively before sending it off to the render farm. This proved a great way to work, and something that saved us a significant amount of time.

With physically-based lighting and shading, sometimes there are times when a few rays manage by chance to hit very bright light sources such as the sun. This weights the final brightness of the pixel very high – much higher than its neighbours – causing speckles or 'fireflies' in the render.

One way of fixing this is to increase the sampling of the shaders so each shade call is shooting hundreds or thousands of sample rays. This will guarantee a correct result but render times could be ten or even 100 times longer. In production, often it is better to cheat a little to get a nice render on time. The Max Ray Intensity slider allows us to cap the maximum brightness value that a single sample contributes to the final pixel value. For a small speed penalty, this completely cures fireflies and results in a render only slightly different from the 100 per cent physically correct result. A welcome trade-off for those of us with deadlines!

Sometimes you might have a render that has a sneaky little error in it (an object that was supposed to be hidden, for example) and you don't want to do a whole new render. Now we have render masks to come to the rescue – being able to provide a black and white mask to the image sampler so that only those particular pixels you're interested in get rendered. This means that we can fix those pesky little problems without having to do tedious roto or paint work (or indeed a costly full re-render). At present there is no support for Maya 2015's native colour management, although Chaos Group is currently working on implementing this. Overall, V-Ray 3.0 is an excellent product.

Assembly has used V-Ray for several award-winning commercials, including this memorable Sudafed ident

## Essential info

**Price: V-Ray 2.0 upgrades from $420/€300; full workstation licence $1,040/€750**

**www.v-ray.com**

**OPERATING SYSTEMS**

- Windows, Linux, Mac OS X

**TECHNICAL SPECIFICATIONS: SUPPORTED PLATFORMS**

- Maya 2015 (32- or 64-bit)
- Maya 2014 (32- or 64-bit)
- Maya 2013 (32- or 64-bit)
- Maya 2012 (32- or 64-bit)

## The good & the bad

- ✓ Ease of use
- ✓ Speed
- ✓ Developers seem to be actively working on production-focused features
- ✗ We'd love to see feature-parity between the 3ds Max version and the Maya version
- ✗ Doesn't support native colour management of Maya 2015

## Our verdict

| | |
|---|---|
| Features | 9/10 |
| Ease of use | 8/10 |
| Quality of product | 9/10 |
| Value for money | 9/10 |

"Some welcome speed improvements to a render engine that was no slouch, plus other helpful new features"

**Final Score 9/10**

# QUALITY. INNOVATION. RESPECT

www.gamestm.co.uk

games TM
JUST CAUSE 3 EVERYTHING YOU NEED TO KNOW
WATCH DOGS 2
PS4 AND XBOX ONE BUYER'S GUIDE
LEFT 4 DEAD IN SPACE
EVOLVE
A NEW BREED OF CO-OP GAMING
WHY IT CAN ONLY BE DONE ON NEXT-GEN
HOW TURTLE ROCK PERFECTED 4V1
HOW WILL WORLD OF WARCRAFT END?
HIGHLIGHTS
THE WITCHER 3: WILD HUNT ■ BATTLEFIELD HARDLINE ■ YOSHI'S WOOLLY WORLD
GUILTY GEAR XRD -SIGN- ■ RESIDENT EVIL REVELATIONS 2 ■ HYPER LIGHT DRIFTER
FOOTBALL MANAGER 2015 ■ DREAMFALL CHAPTERS ■ FLAME OVER
INSIDE DESTINY
ALL THE PS4 AND XBOX ONE GAMES YOU NEED TO OWN
HIGHLIGHTS
HOW TO MAKE THE NEXT MARIO
PS4 & XBOX ONE EVERY
13 STEPS TO INDIE GAME SUCCESS
FINAL FANTASY XV
WILL MICE KILL MINE
Mojang's big plans ■ Microsoft's master
FIRST REVIEW INSIDE
GRAN TURISMO SPECIAL
"ONLY MY MUM BOUGHT IT"
THE DEATH OF CONSOLES?
THE RETURN OF REAL FEAR
FALL OF DUTY?
EXPOSING EPIC GAMES

games TM

Available from all good newsagents and supermarkets

## ON SALE NOW

■ EVOLVE EXPOSED ■ WATCH DOGS 2 DETAILS ■ BUYER'S GUIDE

## BUY YOUR ISSUE TODAY

Print edition available at www.imagineshop.co.uk

Digital edition available at www.greatdigitalmags.com

Available on the following platforms

Print Tablet Phone Desktop

facebook.com/gamesTM twitter.com/gamesTMmag

INDUSTRY ● EDUCATION ● RECRUITMENT ● CAREERS

# workspace 3D

Inside guide to industry news, studios, expert opinion and education

**90** News

## Industry news

We learn how disabled children can now design and 3D-print models using only their eyes, among other things

**92** Industry Insider

## Chris Doran

The real-time revolution is here. We meet with Chris Doran to find out what it can mean for videogame lighting

inside

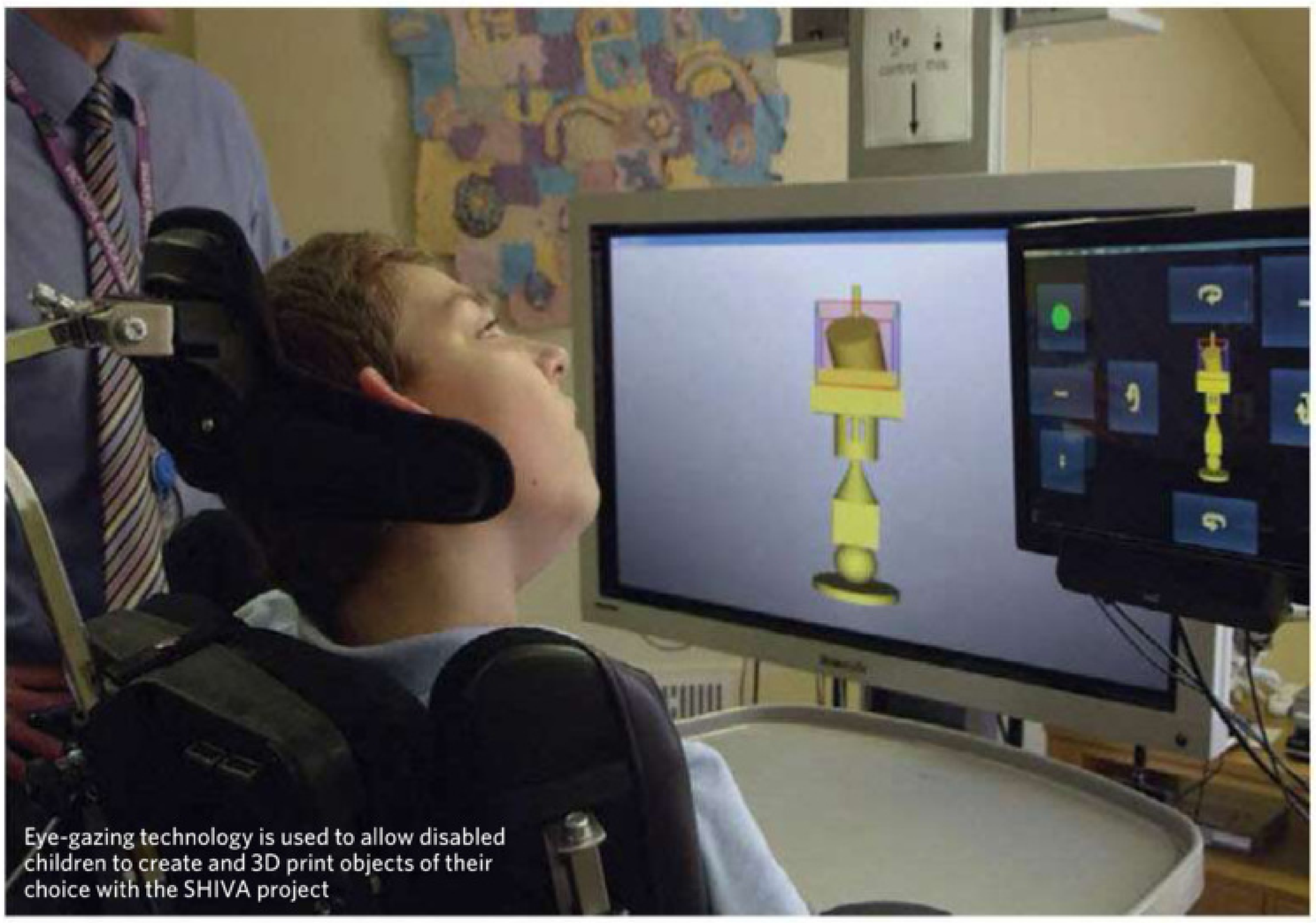

> “I guess I’ve now studied light as a quantum field, a wave, photon trajectories in a gravitational background, as a ray, as a beam, and as a diffuse source of energy!”
>
> **Chris Doran,** Page 92

*Harkyn from Lords Of The Fallen*, courtesy of CI Games

**Geomerics**

Director of Geomerics Chris Doran tells us more about the studio’s new lighting technology, Enlighten


To advertise in **workspace** please contact
Simon Hall on **01202 586415** or **simon.hall@imagine-publishing.co.uk**



Eye-gazing technology is used to allow disabled children to create and 3D print objects of their choice with the SHIVA project

# Disabled students can design with their eyes

## A disability college is pioneering new technology allowing students to design and 3D print using just their eyes

**First started in 2010 by a group including professor Alexander Pasko and his team at the National Centre for Computer Animation at Bournemouth University, the SHIVA (Sculpture for Health-care: Interaction and Virtual Art in 3D) project will help disabled people design an object in 3D and print a 3D model using eye-gaze technology.**

The technology – which is now used by Victoria Education Centre (VEC), a school for children with physical disabilities, allows for any user who cannot use a touchscreen to have their eye movements tracked. These movements are then translated into screen coordinates so that on-screen cells or buttons can be selected.

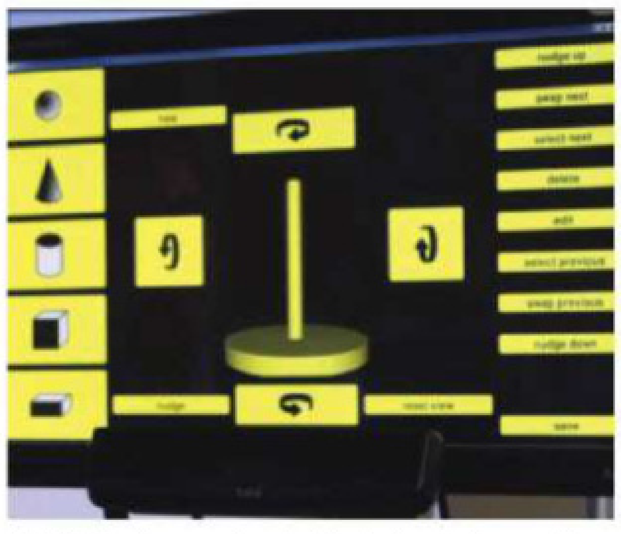
"A piece of software which can help someone create something independently, or make them proud of what they have created is going to build self-esteem; that's going to make them feel better and have fun," said Professor Pasko.

After selecting a shape of their choice, a user will be able to then modify it by combining the shape with other shapes, manipulating the scale, and removing portions of the shapes.

Find out more at the Applied Shapes website www.appliedshapes.com, where SHIVA will be supported and distributed once made fully open to the public.

### The Results

SHIVA has now allowed young disabled students at VEC to design and print objects in 3D. This enables the children to see the physical examples of what their creativity at the computer has achieved. The innovative software will remain in use in the hope that funding is acquired for further development.



SHIVA also has a customisable display that can suit different disabilities with adjustable screen colours and cell size for the visually impaired

# Passion signs ex-Pixar director

## Saschka Unseld, director of The Blue Umbrella, joins the team in New York

**After creating Pixar's very popular short, 'The Blue Umbrella' – which screened to audiences before *Monsters University* in 2013, as well as working on *Toy Story 3*, *Cars 2* and *Brave* among many others, Saschka Unseld is now leaving Pixar and joining international animation and film production company, Passion Pictures, as creative director.**

"I've done a bit of a reverse-commute here. I think I'm the first to go from directing at Pixar to directing in commercials and that's because there are very few companies that work the way Passion works," said Unseld. "It's a rare chance to be part of a company that floods every project with creativity and innovation."

Alongside his work for Pixar, Unseld also works with virtual reality and is directing several films for some of the industry's VFX pioneers: knowledge that will be a big part of his new role to tailor executions for the latest immersive and reactive content platforms as well as briefs from gaming and advertising clients.

A Hamburg native, Unseld graduated from world-renowned Filmakademie Baden-Württemberg film school in Stuttgart



● **HAVE YOU HEARD?** • The Peanuts characters will make their big-screen debut with a 3D animated movie in 2015

To feature in **workspace**[3D] please contact Larissa Mori on **01202 586239** or **larissa.mori@imagine-publishing.co.uk**

# Mischief is snapped up

## $25 app brings The Foundry to the mass market

**The Foundry has announced the acquisition of digital painting app Mischief, with an updated version 2.0 of the software and a new subsidiary, Made With Mischief.**

Initially the brainchild of former professor and Disney research consultant Sarah Frisken, Mischief is well known for its sophisticated core technology: Adaptively Sampled Distance Fields (ADFs). Co-invented by Frisken herself, ADFs allow for high-quality stroke rendering, and are very compact, resulting in small file sizes. They can even be scaled without introducing pixelation artefacts.

Of course, the huge potential for Mischief's ADF technology lies not only with its digital 2D drawing capabilities, but with its ability to become a technology within The Foundry's other software such as MARI or MODO. ADFs could be used to hugely improve the 3D pipeline with support for applications such as sculpting, for instance.

Mischief's infinite canvas and incredible zoom ratio allow for all the canvas space you could ever need. Download in full for $25 (approx £16), or a limited-feature free version at **www.madewithmischief.com**

# Redefining facial capture

## Dimensional Imaging delivers new camera system

**Initially being offered as a service and later as a licence for internal use, world-leading facial capture company Dimensional Imaging's new DI3D HMC is the world's only commercial head-mounted facial capture system to use passive stereo photogrammetry to acquire per-frame '3D scan' data.**

"Leading developers are looking to push the facial marker count up to 150, but are struggling to achieve this with traditional solutions," Colin Urquhart, the company's CEO said. "Our DI4D HMC solution can easily track many times this number of points."

The new DI3D HMC will be able to acquire much denser and higher fidelity facial data than traditional marker or feature-based solutions

# Maground UK launch

## London welcomes largest online supplier of HDR Domes

Get a taste for what Maground has to offer with its exclusive landscape images and HDR Domes available with this issue's FileSilo downloads

**After first being established in 2007 with offices in Hamburg, Los Angeles and Beijing, Maground has now expanded further by opening a brand new sales office in central London.**

Aimed at creative professionals, the leading stock photo agency's website Maground.com provides an extensive selection of landscape, street and urban photography, as well as high-quality HDR Domes for any 3D lighting needs.

"We are very excited to be establishing ourselves as the go-to brand for 3D, CGI and creative professionals in the UK" said Jens Mueller, joint CEO at Maground. "The UK market offers significant potential and we are pleased to consolidate further our position within Europe."

# Software shorts

## Bringing you the lowdown on product updates and launches

### Keyshot 5.1

Luxion has released its first update to the pivotal KeyShot 5, with new additions and improvements including six new procedural textures, multi-touch support for devices running Windows, Retina Display support for Macs, and Cinema 4D support via KeyShot's direct import. KeyShot 5.1 is available immediately for download as a free upgrade to all customers with a subscription.

### Sapphire 8

GenArts has announced the release of Sapphire 8, the latest update to the company's visual effects engine. New features include 'Builder', which lets users create their own effects and transitions by combining existing Sapphire effects together. To learn more, visit **genarts.com**

### Elementacular 1.2

Alexandra Institute has announced the release of Elementacular 1.2, a new update to the Maya plug-in that allows users to create photorealistic clouds through intuitive modelling directly in the Maya viewport, where they will be rendered in real-time. A personal licence for Elementacular 1.2 is $175 (approximately £112) and is available for download at **www.elementacular.com**.

# RenderMan 19

## Pixar announces the latest RenderMan available for commercial use

For other users, the previously announced free non-commercial RenderMan is due in early 2015

**From this release onwards, RenderMan will now support multiple methods of light transport.** This includes a unidirectional path tracer supplied with source code, a new bidirectional path-tracer with photons (VCM), enhancements to the existing REYES renderer, and many other upgrades due to the new RIS rendering architecture with progressive rendering. Pixar's renderer will be combining both the RenderMan Pro Server and RenderMan Studio into one product, and all commercial customers on current maintenance are entitled to a free upgrade.

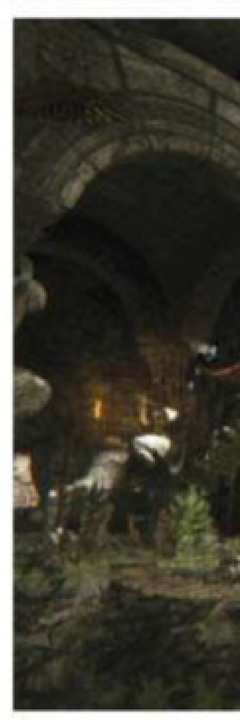
**DID YOU KNOW?** • BBC reports 4K film technologies could present animation challenges due to the increased resolution

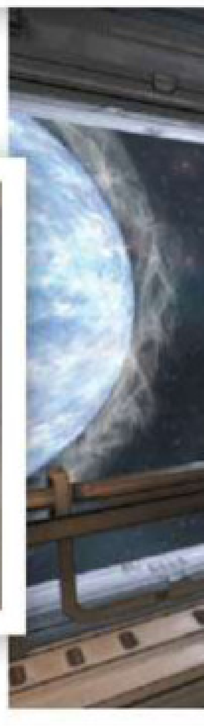
Industry insider

# Chris Doran

Director, Geomerics

## The real-time revolution is here, but what does it mean for lighting in videogames? We met with Chris Doran to find out





## About the insider

**Job title** Director, Geomerics
**Location** UK
**Website** www.geomerics.com
**Biography** Chris Doran set up Geomerics in 2005 at Cambridge University, with a goal to bring the latest development in academic research into the games industry. Enlighten was released in 2008 – the first real-time global illumination technology that was practical for videogames. In 2013 Geomerics was acquired by ARM, which designs processors at the heart of mobile devices

**From the artillery-ravaged battlegrounds of *Battlefield 4* to Professor Quadrangle's colourful *Quantum Conundrum* mansion, Geomerics' lighting technology Enlighten has changed the way we perceive real-time lighting in our entertainment.** The astonishingly impressive tech demos that were recently released, showcasing Global Illumination with Enlighten in Unreal Engine 4, only further emphasises what the software is capable of.

Enlighten was created at Cambridge University by a team led by Chris Doran – a research academic whose initial focus was on cosmology and quantum field theory. "Around 2000, I started applying some of the techniques to problems in computer vision, and that led gradually on to further problems in graphics and lighting," he tells us. "I guess I've now studied light as a quantum field, a wave, photon trajectories in a gravitational background, as a ray, as a beam, and as a diffuse source of energy!"

Enlighten is now making its big push into the next generation of consoles, and the results are stunning indeed. "The real-time technologies developed in the games industry are now getting so good that they really are pushing towards photorealism – at least for a restricted range of phenomena," says Doran. "The latest work on physically-based shading has taken this to a higher level."

We sat down with Doran to discuss real-time lighting today, and where it may be heading in the future...

**What challenges are game artists facing today with real-time lighting?**

This is a very broad question, and it partly depends where you look. At the high end, the challenges are around getting great-looking specular highlights and reflections off intricate surfaces. Techniques exist, but as is often the case in real-time graphics, they are hard to code up and fiddly to get right. More work is required to make these more artist-friendly.

On mobile devices, where an increasing number of games are being played, the challenges are a little different. Techniques have to be developed from the point of view of power consumption, rather than compute limitations. When you see that moving data around on the GPU is one of the more costly operations, you start to see that desktop techniques, which are unconstrained by power, start to become impractical on mobile. This is an increasingly active field of research and is leading to new ideas in areas as fundamental as dynamic shadows.

**What new developments can we expect to see in real-time lighting in the current generation of consoles?**

The tipping point will come in the next year or so, when the really big franchises stop developing for cross-generational platforms and focus solely on the new generation. There are some powerful GPUs in those boxes, with fast, unified memory. We are only starting to see today what they are truly capable of. In smaller, stylised settings you are already seeing some stunning results. *The Tomorrow Children* is an interesting example, showcasing a lot of modern techniques in a constrained environment.

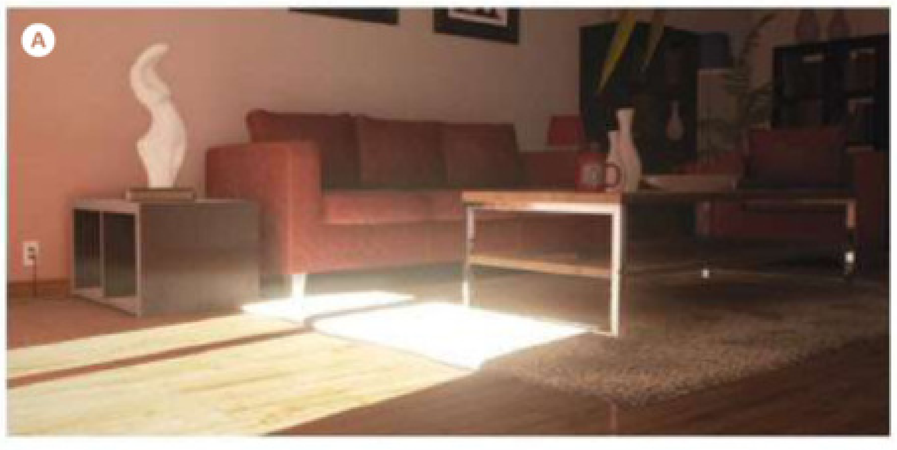
**What do you expect to be the next big milestones in real-time lighting? What features will we be seeing in five years' time?**

Good quality real-time soft shadows remain a challenging problem, as do many of the techniques that involve quite diffuse lighting sources. Our focus has been on radiosity for many years, and we have reached a firm conclusion that ray-tracing type techniques are inappropriate in this domain. You need smarter algorithms to perform your integrals in real time. That goes for specular highlights as well. Techniques exist for all of these problems, but they are fiddly and nobody is totally satisfied. More research, and the steady march of GPU technology, should see these cracked!

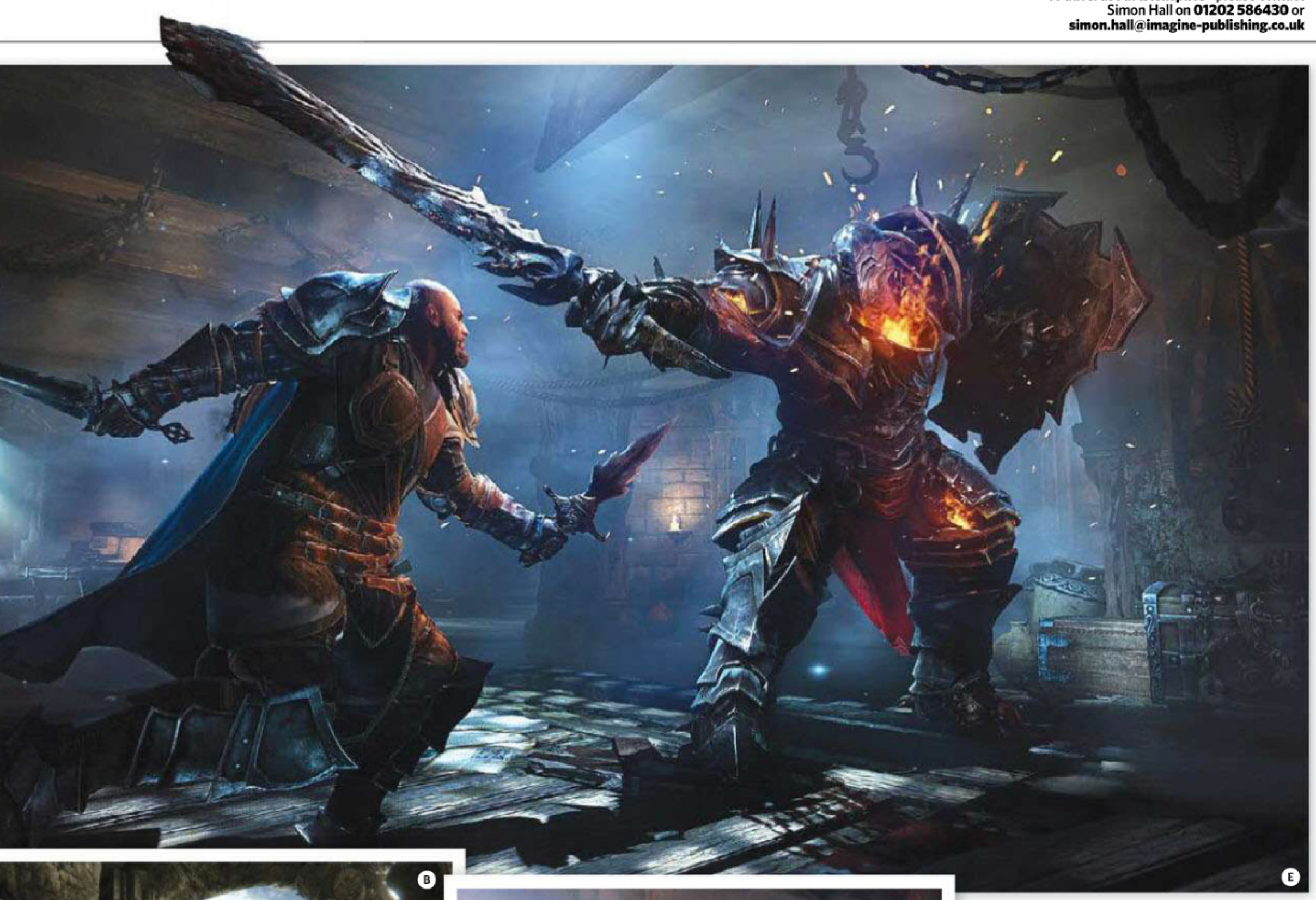
## Portfolio highlights

Some major projects that Chris Doran has worked on:

**2013** *Battlefield 4*
**2013** *The Bureau: XCOM Declassified*
**2012** *Quantum Conundrum*
**2011** *Need For Speed: The Run*
**2011** *Battlefield 3*



workspace3D
To advertise in workspace3D please contact
Simon Hall on 01202 586430 or
simon.hall@imagine-publishing.co.uk



E

B

D

C

## The future of lighting

**Chris Doran explains to us how Geomerics is looking to the VFX industry for the next advances in computer graphics**

"We're now starting to work with film VFX companies to understand their workflows and requirements. Over the next ten years we will see increasing convergence in technologies. Unlike previous eras where this has been a one-way process, this will be a genuine convergence. Games developers have been out developing real-time techniques independently of what the film guys have been up to, and it's going to be fascinating seeing how the two combine. It's an area we are really interested in."

**A** Geomerics is going mobile. "As increasing amounts of content are consumed on mobile, it'll be exciting to see how artists and devs exploit it."

**B** Doran says that shaders are changing what's possible in games. "Controllers offer a range of material models, and on the lighting side we interact with them to great effect."

**C** "Our big push is wrapping up tech into a pipeline," says Doran. "Building your own pipeline is a major undertaking – we intend to have a ready-made solution."

**D** "I expect to see more games lit with real flair, as the constraints of the previous generations are lifted," says Doran of the current console generation.

**E** "[In the future] I expect dynamic lighting to be totally routine," says Doran. "If you have a gun and there is a light in the ceiling, you should be able to shoot it out!"

# Technique focus

**Incredible 3D artists take us behind their artwork**

**ENVIRONMENT DESIGN** A shot of Spirit Lake beneath Mount St Helens. The goal was to get the look of the mountain with the blown-up flank that disappeared during the 1980 eruption. I could have used DEM data to get the accurate shape, but I wanted to do it with my own hands using Vue's built-in terrain editor and World Machine to do the erosion. **Mount St Helens,** 2014

Massimo Verona
3DArtistonline
**Username:** Massi San

**Website**
http://massi-san.deviantart.com
**Country** Netherlands
**Software used** Vue 2014.6, World Machine

# If Apple made a magazine

www.icreatemagazine.com

Mac, iPad & iPhone
FREE 2GB OF VIDEO TIPS, FONTS AND ICONS
iCreate
Mac iPad iPhone
PROBLEMS SOLVED
Speed up your device
Boost battery life
Wi-Fi & Bluetooth issues fixed
APPLE WATCH DEVELOPERS SPEAK
MASTER iCLOUD DRIVE
THE BEST MAC EVER?
FREE UP DISK SPACE
CREATE A CALENDAR
MARK UP IMAGES AND PDFS IN MAIL
CUSTOMISE OS X YOSEMITE
FREE Mac, iPad & iPhone
OVER 60 PAGES OF OS X & iOS GUIDES
ORGANISE iPHOTO
GET SET FOR iOS 8
Slow-motion effects
Mac, iPad & iPhone
ALL-NEW iPADS REVIEWED
GENIUS BAR
Video tips Downloads
SAY GOODBYE TO YOUR WALLET?
iCLOUD DRIVE MADE EASY
SET UP FAMILY SHARING
THE MISSING iLIFE APPS

FREE RESOURCE DOWNLOADS EVERY ISSUE

# iCreate™

Available from all good newsagents and supermarkets

## ON SALE NOW

**• All your Mac, iPad & iPhone problems solved • Customise OS X Yosemite**

## BUY YOUR ISSUE TODAY

Print edition available at www.imagineshop.co.uk

Digital edition available at www.greatdigitalmags.com

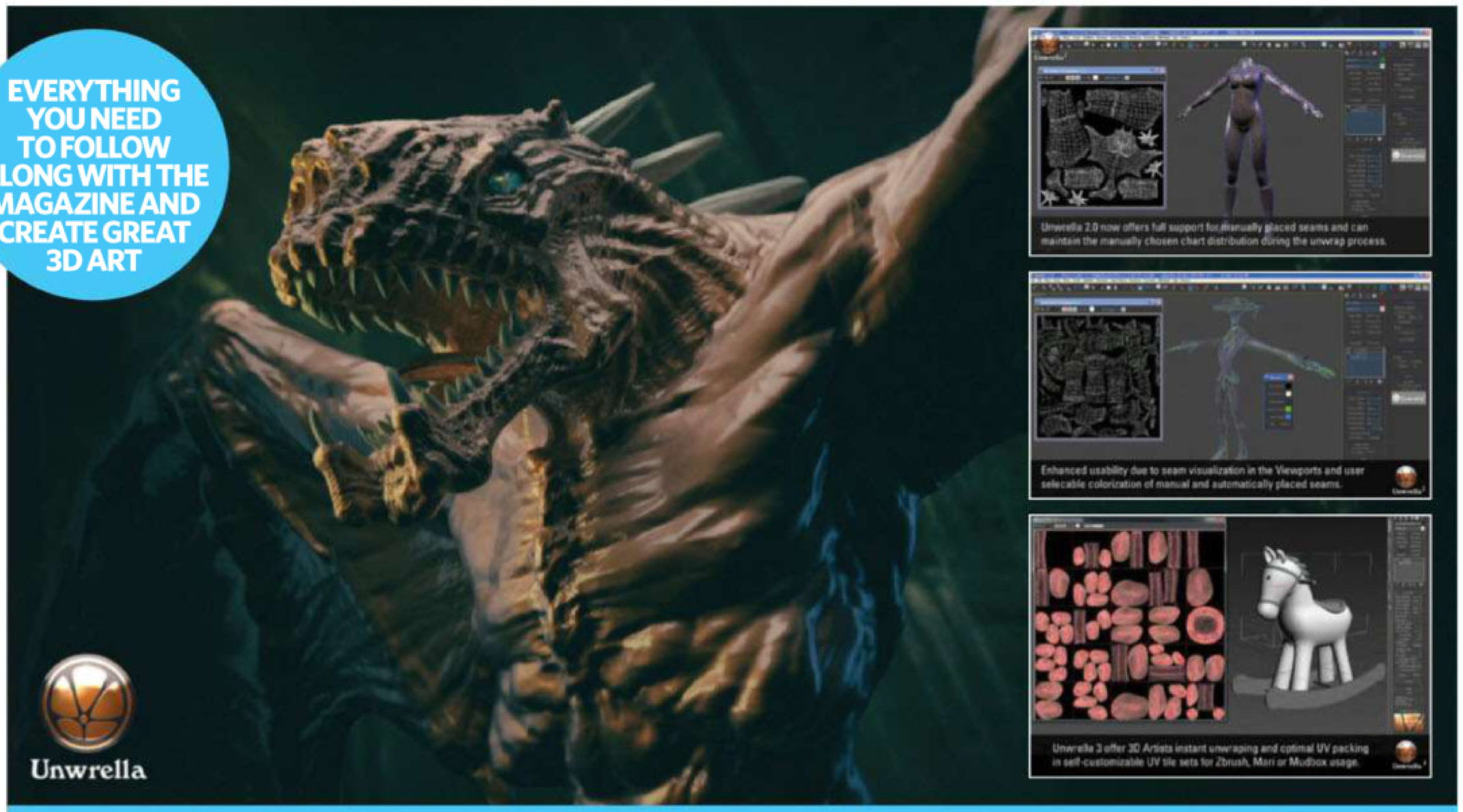
Available on the following platforms

Print Tablet Phone Desktop

facebook.com/icreatemagazine twitter.com/icreatemagazine

# YOUR FREE RESOURCES

Log in to **filesilo.co.uk/3dartist-76** and download your 3D resources **NOW!**


EVERYTHING YOU NEED TO FOLLOW ALONG WITH THE MAGAZINE AND CREATE GREAT 3D ART
Unwrella 2.0 now offers full support for manually placed seams and can maintain the manually chosen chart distribution during the unwrap process.
Enhanced usability due to seam visualization in the Viewports and user selecable colorization of manual and automatically placed seams.
Unwrella 3 offer 3D Artists instant unwraping and optimal UV packing in self-customizable UV tile sets for Zbrush, Mari or Mudbox usage.
Unwrella

## EXCLUSIVE 20% DISCOUNT ON UNWRELLA

**THIS MONTH'S COMBINED RESOURCE SIZE: 5GB**

## YOUR BONUS RESOURCES

**ON FILESILO THIS ISSUE, FREE AND EXCLUSIVE FOR 3D ARTIST READERS, YOU'LL FIND 5GB OF RESOURCES, INCLUDING...**

- Two trial versions of BZP Pro Smart Skinner for both PC and Mac
- 25 incredible textures from 3DTotal
- 3D leaves pack from Sérgio Merêces
- Brush pack for Affinity Designer
- Hi-res images and HDRIs from Maground
- 10 arch-vis furniture models
- Expert video tutorials
- All of the tutorial image files to help you follow along with the issue

FileSilo

## filesilo.co.uk/3dartist-76

# FILESILO – THE HOME OF PRO RESOURCES

## Discover your free online assets

- A rapidly growing library
- Updated continually with cool resources
- Lets you keep your downloads organised
- Browse and access your content from anywhere
- No more torn disc pages to ruin your magazines
- No more broken discs
- Print subscribers get all the content
- Digital magazine owners get all the content too!
- Each issue's content is free with your magazine
- Secure online access to your free resources

This is the new FileSilo site that replaces your disc. You'll find it by visiting the link on the following page

The first time you use FileSilo, you'll need to register. After that, you can use your email address and password to log in

The most popular downloads are shown in the carousel here, so check out what your fellow readers are enjoying

If you're looking for a particular type of content, like software or video tutorials, use the filters here to refine your search

Can't find the resource you're looking for in these filters? Click on More Types to specify what kind of resource you want

Green open padlocks show the issues you have accessed. Red closed padlocks show the ones you need to buy or unlock

Top Downloads are listed here, so you can get an instant look at the most popular downloaded content

Check out the Highest Rated list to see the resources that other readers have voted for as the best

Find out more about our online stores, plus useful FAQs such as our cookie and privacy policies and contact details

Discover our fantastic sister magazines and the wealth of content and information that they provide

# HOW TO USE FileSilo

**EVERYTHING YOU NEED TO KNOW** ABOUT ACCESSING YOUR NEW DIGITAL REPOSITORY

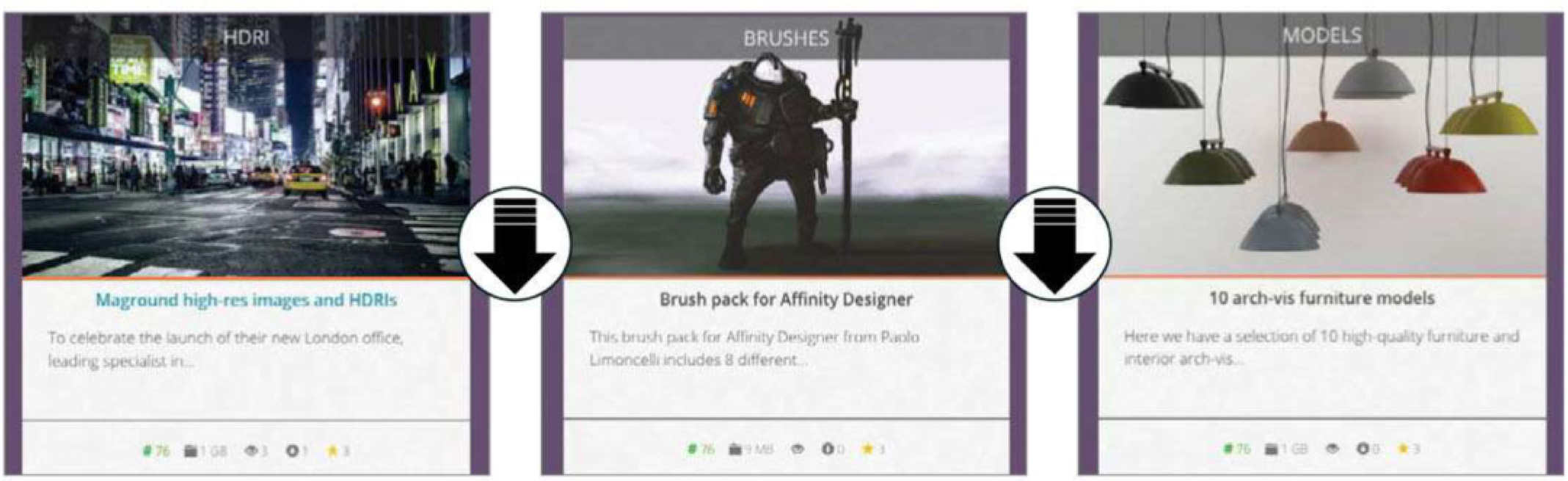
## To access FileSilo, please visit **filesilo.co.uk/3dartist-76**

01 Follow the on-screen instructions to create an account with our secure FileSilo system, and then log in and unlock the issue by answering a simple question about the magazine. You can access the content for free with each issue of **3D Artist**.

02 If you happen to be a print subscriber, you can easily unlock all the content by entering your unique Web ID. Your Web ID is the eight-digit alphanumeric code that is printed above your address details on the mailing label of your subscription copies. It can also be found on any renewal letters you receive.

03 You can access FileSilo on any desktop, tablet or smartphone device using any popular browser (such as Safari, Firefox or Google Chrome). However, we recommend that you use a computer to download content, as you may not be able to download files to your phone or tablet.

04 If you have any problems with accessing content on FileSilo, or with the registration process, take a look at the FAQs online or email **filesilohelp@imagine-publishing.co.uk**.


HDRI
Maground high-res images and HDRIs
To celebrate the launch of their new London office, leading specialist in...
BRUSHES
Brush pack for Affinity Designer
This brush pack for Affinity Designer from Paolo Limoncelli includes 8 different...
MODELS
10 arch-vis furniture models
Here we have a selection of 10 high-quality furniture and interior arch-vis...

# NEED HELP WITH THE TUTORIALS?

Having trouble with any of the techniques in this issue's tutorials? Don't know how to make the best use of your free resources? Want to have your work critiqued by those in the know? Then why not visit the **3D Artist** Facebook page for all your questions, concerns and qualms? There is a friendly community of fellow 3D artists to help you out, as well as regular posts and updates from the magazine team. Like us today and start chatting!

## facebook.com/3DArtistMagazine

Issue 77 of **3D Artist** is on sale **04 February 2015** from GreatDigitalMags.com

# I ♡ MODELING

“MODO’s flexibility and fast polygon modeling tools allow me to go through many iterations fast - exactly what I need when doing concept work. MODO’s interface and workflows are very artist-friendly and intuitive. On top of that, plugins like Mesh Fusion give MODO huge potential to become a game changer across the entire 3D realm.

**Gavriil Klimov**
Concept artist

THE FOUNDRY.

MODO

FROM THE MIND OF CHRISTIAN PATCHELL
AND THE CLASS OF SEPTEMBER 2014

# the BROTHERS BRIMM

DAVE SCHOOL

WATCH IT NOW!
www.DaveSchool.com

See what our students can do after our intensive 12-month Digital Animation and Visual Effects program!

TO SPEAK WITH ADMISSIONS OR TO SCHEDULE A TOUR, PLEASE **CALL (855)328-3839**
THE DAVE SCHOOL IS LOCATED ON THE BACK LOT OF **UNIVERSAL STUDIOS®** IN ORLANDO, FLORIDA

THE DAVE SCHOOL IS NOT OPERATED BY NOR AFFILIATED WITH UNIVERSAL ORLANDO